MX45GM

Intel® Socket P GM45 Chipset supports Intel® 45nm Mobile Core™ 2 Extreme,/ Core™ 2 Duo / Celeron processors Mini ITX Motherboard.

User's Manual   Ver. 1.00

Contents

FCC Statement

THIS DEVICE SUPPORTS PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

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Notice

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This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by BCM, or which have been to misuse, abuse, accident or improper installation. BCM assumes no liability under the terms of this warranty as a consequence of such events.
Because of BCM high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of BCM products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, BCM products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.

3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.

4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Manual Objectives

This manual describes in detail the BCM MX45GM Mini-ITX motherboard.

We strongly recommend that you study this manual carefully before attempting to interface with MX45GM or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors concerning this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Document Amendment History

Revision	Date	Comment
V1.00	Nov. 02, 2009	First Release

Chapter 1

This chapter describes the motherboard features and the new technologies it supports.

Product Introduction

MX45GM Specifications

System

CPU	Supports Intel® socket P Core™ 2 Duo / Intel® Core™ 2 Extreme / Celeron 575 585 mobile CPU with 45nm process technology
FSB	667/800/1066 MHz
BIOS	AMI 32Mb SPI BIOS
System Chipset	Intel GM45/ICH9M-E
I/O Chipset	Winbond W83627DHG-A
Memory	2 x 200-pin SODIMM socket supports up to 4 GB Dual channel DDR2 667/800 SDRAM
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring CPU temperature, voltage, and cooling fan status. Auto throttling control when CPU overheats
Expansion Slots	1 x PCI slot (PCI Rev.2.2 compliant)
	1 x PCI Express x1 Slot
	1 x Compact Flash Type I/II socket
S3	S3 Support
SmartFan Control	Yes

Display

Chipset	Intel Graphics Media Accelerator 4500MHD
Display Memory	Intel DVMT 5.0 supports 1GB video memory
Resolution	2048 x 1536 @ 32 bpp(@ 60Hz)
Dual Display	CRT + LVDS or CRT + DVI-D or CRT + HDMI
LVDS	Dual-channel 24-bit LVDS
DVI	Chrontel CH7318C DVI transmitter up to 165M pixels/second
HDMI	TI SN75DP139 Display Port to TMDS transmitter

Audio

Audio Codec	Realtek ALC888 Audio Codec
	5.1+2 CH. with two independent audio stream
Audio Interface	Mic in, Line in, Line out
Audio Amplifier	TPA3005D2 Stereo 6Watt per channel

Ethernet

|	
LAN1	Intel 82567LM Gigabit Ethernet Controller
LAN2	Intel 82574L PCI-E Gigabit Ethernet Controller

Onboard I/O Headers

SATA & SATA Power	4 x Standard SATA Connectors / 2 x SATA Power Connectors
COM	2 x RS-232 Headers (4 ports, 1 with Voltage Selection)
USB	2 x USB 2.0 Headers (4 ports)
SPDIF	1 x SPDIF Header
Front Audio	1 x Front Audio Header

Amplifier	1 x Amplifier Header
GPIO	16-bit General Purpose I/O for DI and DO
LVDS	1 x LVDS Connector
Inverter	1 x Inverter Connector
Front Panel	1 x Front Panel Header
Back I/O Panel	
Display	1 x DB15 Connector / 1 x DVI-D Connector / 1 x HDMI Connector
LAN / USB / Audio	2 x Stack up RJ45 and USB Connectors / 1 x 3 Jacks Audio connector
RS	1 x COM Port (with voltage selection) / 1 x DIN 6
DC-In	1 x Barrel Type DC In
Power \ Mechanical \ Environmental	
Power Requirement	19V ~ 24V
Power Type	19VDC/ 5A and up. Barrel Type (Int. dia 2.5mm – 3mm; Ext. dia 5.5mm)
Operating Temp.	0C – 60C
Operating Humidity	0C – 90C Relative Humidity , Non-Condensing
Form Factor	Mini-ITX
Size (L x W)	6.7" x 6.7"
Weight	0.88" lbs

Note: Specifications are subject to change without notice.

Block Diagram
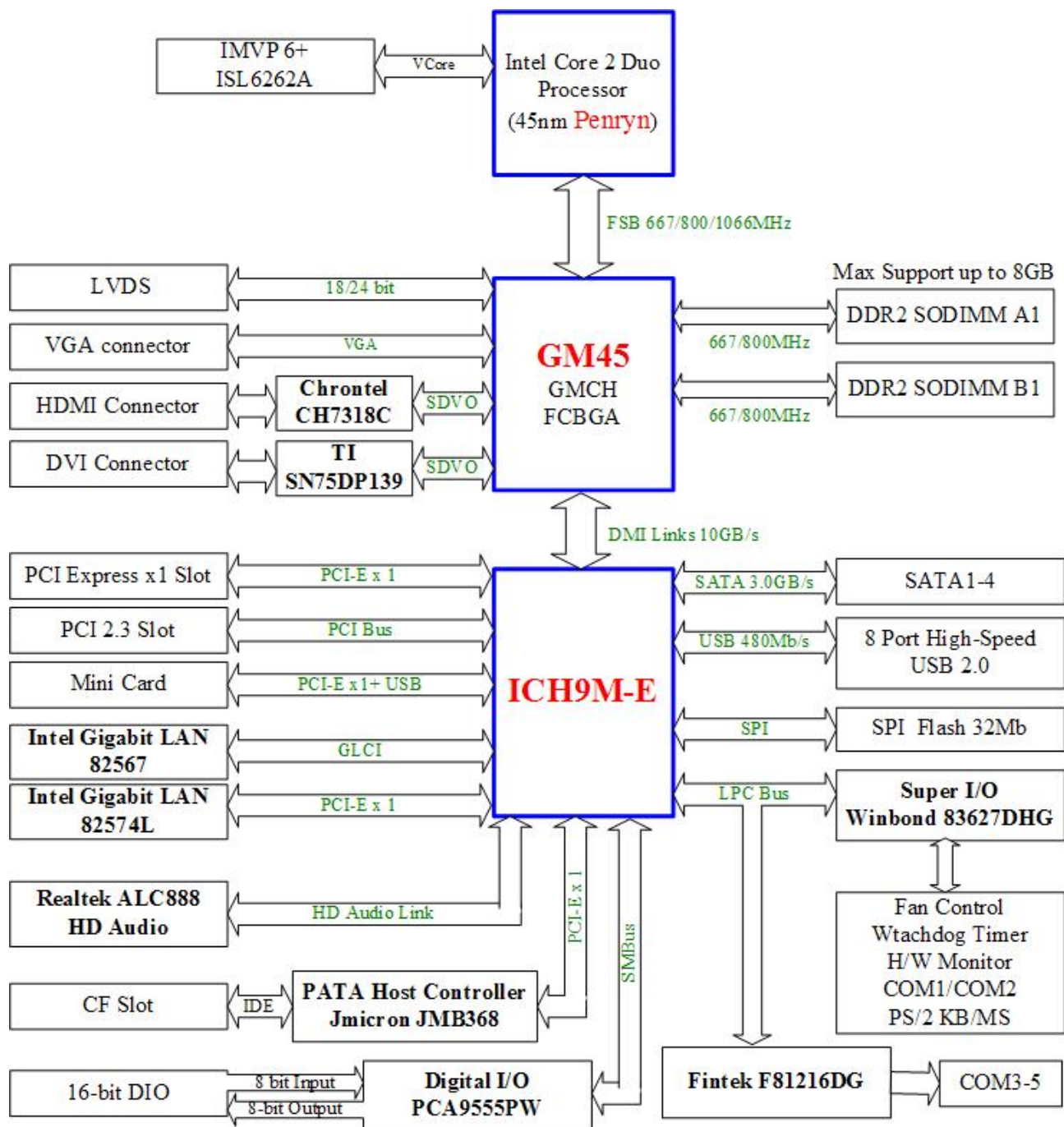
Before you Proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

	• Unplug the power cord from the wall socket before touching any component. • Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity • Hold components by the edges to avoid touching the ICs on them. • Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component. • Before you install or remove any component, ensure that the power supply is off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1. Motherboard Overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it. Refer to the chassis documentation before installing the motherboard.

> Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

1.1.1   Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

1.1.2   Screw Holes

Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.

> Do not over tighten the screws! Doing so can damage the motherboard.
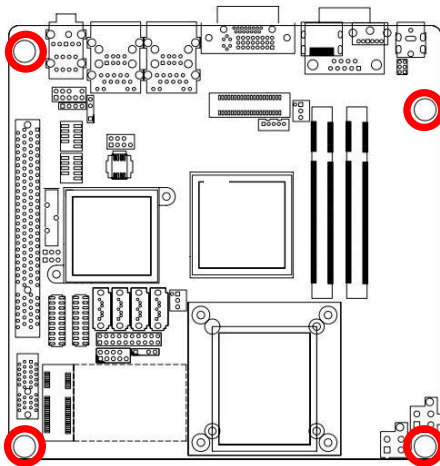
Place this side towards the rear of the chassis

1.1.3 Motherboard Layout

1.1.4 Layout Content List

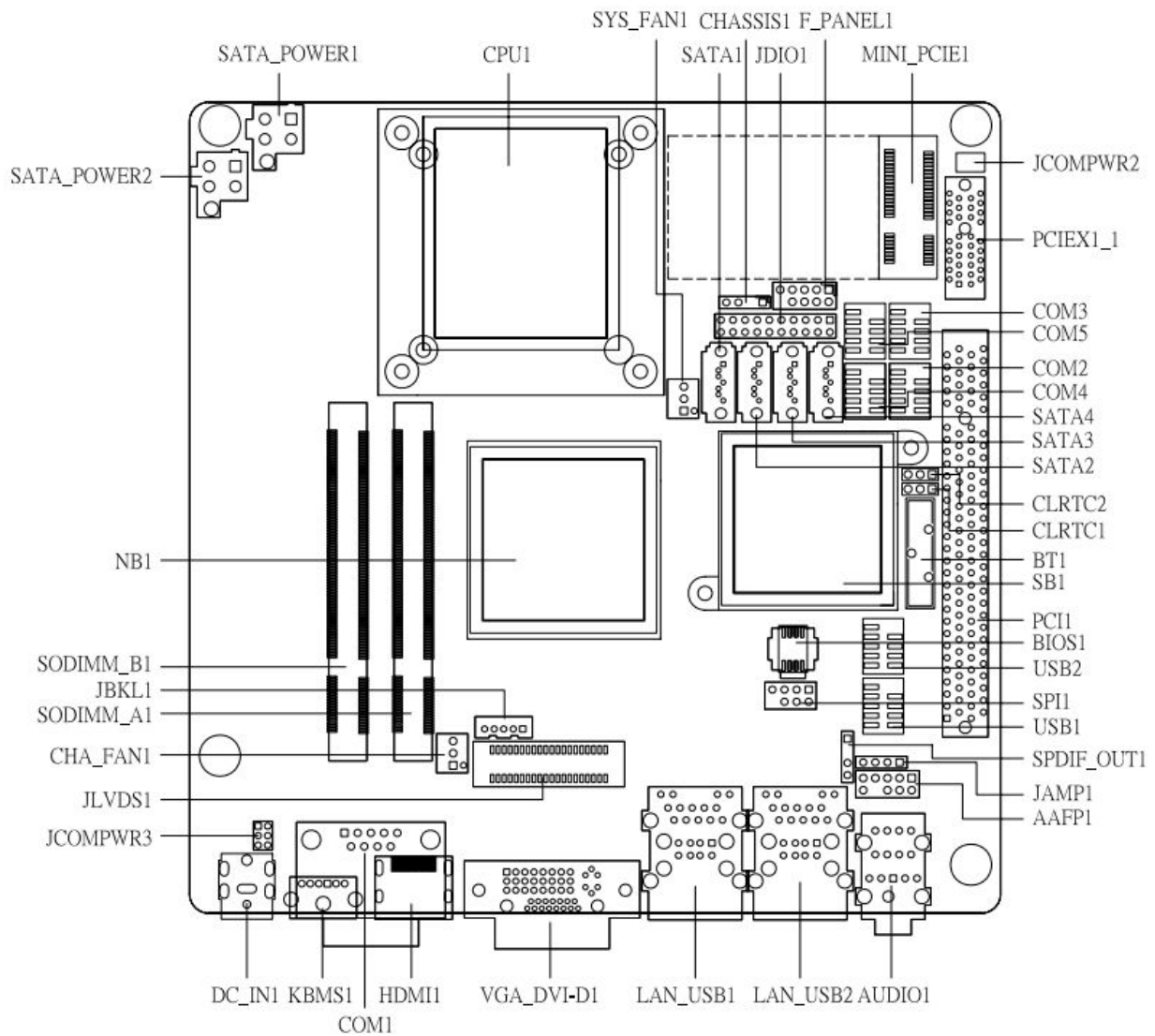| Slots			
Label	**Function**	**Note**	**Page**
CF1A	Compact Flash connector	(Rear side)	N/A
SODIMM_A1	200-pin SODIMM slot 1		22
SODIMM_B1	200-pin SODIMM slot 2		22
PCI1	PCI slot		26
MINI_PCIE1	Mini PCI Express slot		26
PCIEX1_1	PCI Express x1 Slot		26

Jumpers			
Label	**Function**	**Note**	**Page**
CLRTC1	Clear CMOS	3 x 1 header, pitch 2.54mm	27
JCOMPWR3	COM 1 RI/+5V/+12V selection	3 x 2 header, pitch 2.00mm	28
JCOMPWR2	COM 2 RI/+5V/+12V selection	3 x 2 header, pitch 2.00mm	28

Rear Panel Connector			
Label	**Function**	**Note**	**Page**
KBMS1	PS/2 keyboard and mouse	6-pin Mini-Din	30
COM1	Serial port connector	D-sub 9-pin, male	29
VGA_DVI-D1	VGA connector DVI connector	D-sub 15-pin, female	29,30
HDMI1	HDMI connector	HDMI 19-pin	30
LAN_USB1	RJ-45 Ethernet connector x 1 USB connector x 2		29,30
LAN_USB2	RJ-45 Ethernet connector x 1 USB connector x 2		29,30
AUDIO1	Line-in port, Line-out port, Microphone port,	5.1 Channel Audio I/O (3 jacks)	30
DC_IN1	DC-IN Power Jack		29

Internal Connector			
Label	**Function**	**Note**	**Page**
JAMP1	Amplifier connector	4 x 1 header, pitch 2.54mm	31
COM23	Serial port 2 & 3 connector	10 x 2 header, pitch 2.00mm	31
COM45	Serial port 4 & 5 connector	10 x 2 header, pitch 2.00mm	31
CPU_FAN1	CPU fan connector	3 x 1 wafer, pitch 2.54mm	32
SYS_FAN1	System fan connector	3 x 1 wafer, pitch 2.54mm	32
FPIO1	System panel connector	5 x 2 header, pitch 2.54mm	33
JDIO1	Digital I/O connector	10 x 2 header, pitch 2.00m	34
JLVDS1	LVDS connector	HIROSE DF13S-40DP-1.25V	34
JBKL1	LCD Inverter connector	5 x 1 header, pitch 2.00mm	35
CHASSIS1	Chassis Intrusion	4 x 1 header, pitch 2.54mm	35
JSPI1	SPI connector	4 x 2 header, pitch 2.54mm	36
SPDIF_OUT1	Digital Audio connector	4 x 1 header, pitch 2.54mm	36
SATA1,2,3,4	Serial ATA connectors 1,2,3,4	7-pin header	37
SATA_POWER1	SATA Power connectors 1,2	4-pin header	38
SATA_POWER2			
USB1,2	USB 2.0 connector	5 x 2 header, pitch 2.54mm	38

1.2 Central Processing Unit (CPU)

The motherboard comes with a surface mount designed for the Intel® socket P Penryn / Core 2 Duo CPU / Celeron processors.

Please note the marked corner (with gold triangle) on the CPU. This mark should match a specific corner on the socket to ensure correct installation.

Gold Mark

|	
	• Make sure the power is off before you install the CPU. • After installing the CPU, connect the CPU fan cable to the **CPU_FAN1** connector to ensure system stability.

|	
	• Your boxed Intel® socket P Core 2 Duo CPU with 45nm process package should come with installation instructions for the CPU or heatsink. • The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal.

1.2.1 Installing the CPU

1. Locate the CPU socket on the motherboard.

   Before installing the CPU, make sure that the socket box is facing towards you.
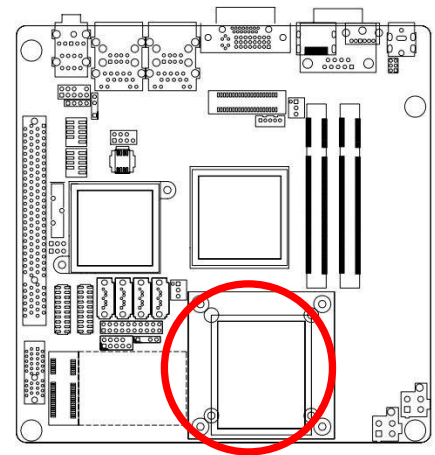
2. The processor socket comes with a screw to secure the processor, please unlock the screw first.
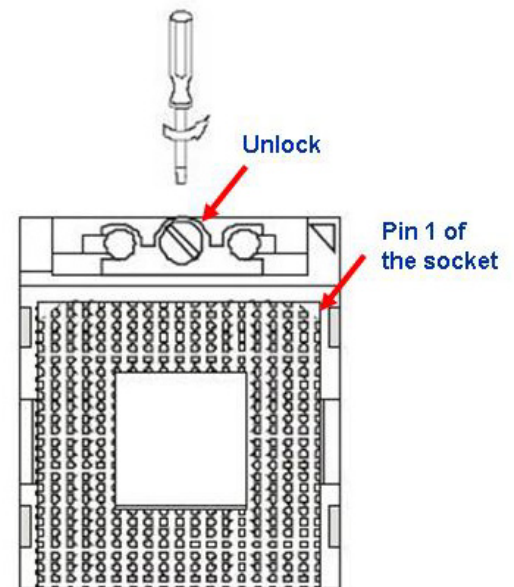
3. Position the CPU above the socket and the gold triangular mark on the CPU must align with pin 1 of the CPU socket.
4. Carefully insert the CPU into the socket until it fits in place 'Gold mark'.
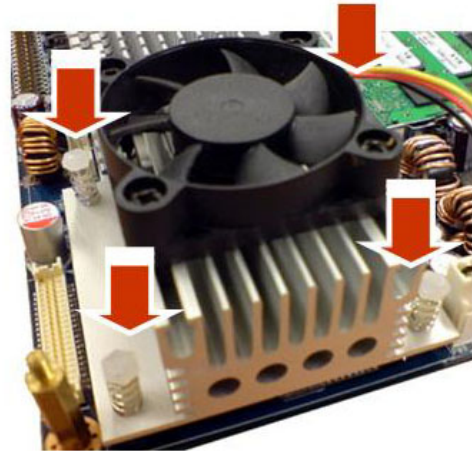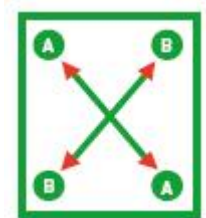5. Turn the screw to the lock position.

   The CPU fits in only one correct orientation. DO NOT force the CPU into the socket to prevent bending the connectors on the socket and damaging the CPU.
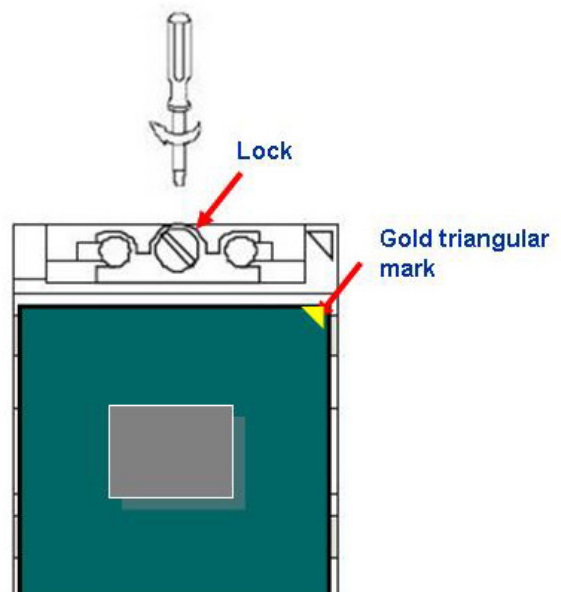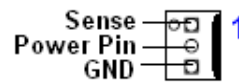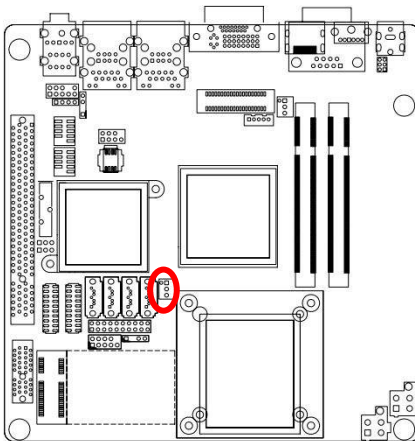
1.2.2 Installing the CPU Heatsink and Fan

1. Screw down two fasteners at a time in a diagonal sequence to secure the heatsink and fan assembly in place.

2. Connect the CPU fan cable to the connector on the motherboard labelled **CPU_FAN1**.


Sense
Power Pin
GND
1

- Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector.
- These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.2.3 Uninstalling the CPU Heatsink and Fan

1. Disconnect the CPU fan cable from the connector on the motherboard.
2. Unscrew each fastener counterclockwise.
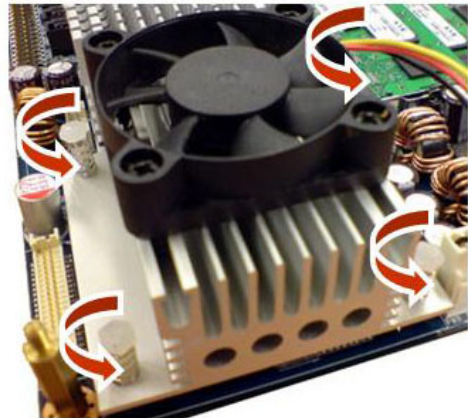
3. Loosen two fasteners at a time in a diagonal sequence to disengage the heatsink and fan assembly from the motherboard
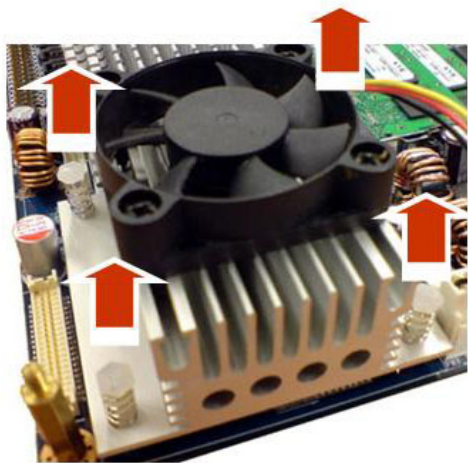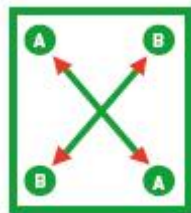
4. Carefully remove the heatsink and fan assembly from the motherboard.

Refer to the documentation in the boxed or stand-alone CPU fan package for detailed information on CPU fan installation.

1.3 System Memory

1.3.1   SO-DIMM Sockets Location

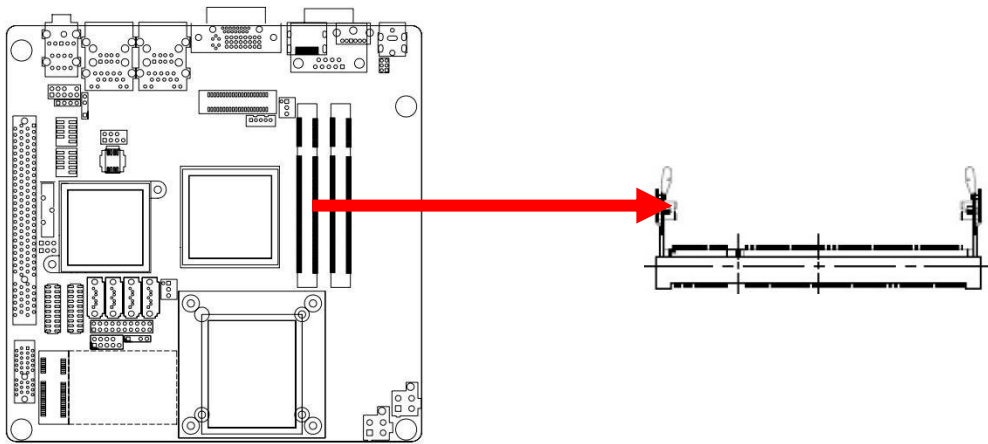The motherboard comes with two 200-pin Double Data Rate 2 (DDR2) SO-DIMM sockets.

A DDR2 module has the same physical dimensions as a DDR SO-DIMM but has a 200-pin footprint compared to the 184-pin DDR DIMM. DDR2 SO-DIMMs are notched differently to prevent installation on a DDR SO-DIMM socket. The following figure illustrates the location of the sockets:

1.3.2   Memory Configurations

You can install 512 MB, 1GB and 2GB DDR2 SDRAM SO-DIMMs into the SO-DIMM sockets using the memory configurations in this section.

- Installing DDR2 SO-DIMM other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations.
- Always install SO-DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Due to chipset resource allocation, the system may detect less than 1 GB system memory when you installed one 1 GB DDR2 memory modules.
- Make sure that the memory frequency matches the CPU FSB (Front Side Bus). Refer to the Memory frequency/CPU FSB synchronization table.

● Memory frequency/CPU FSB synchronization

CPU FSB	DDR 2 DIMM Type	Memory Frequency
533/800MHz	DDR2 667	Max clock Freq: 333MHZ; 667Mb/s
	DDR2 800	Max clock Freq: 400MHZ; 800Mb/s

1.3.3 Installing a DDR2 SO-DIMM

Make sure to unplug the power supply before adding or removing SO-DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Locate the SO-DIMM socket on the board.
2. Hold two edges of the SO-DIMM module carefully, and keep away of touching its connectors.
3. Align the notch key on the module with the rib on the slot.
4. Firmly press the modules into the socket automatically snaps into the mounting notch. Do not force the SO-DIMM module in with extra force as the SO-DIMM module only fit in one direction.
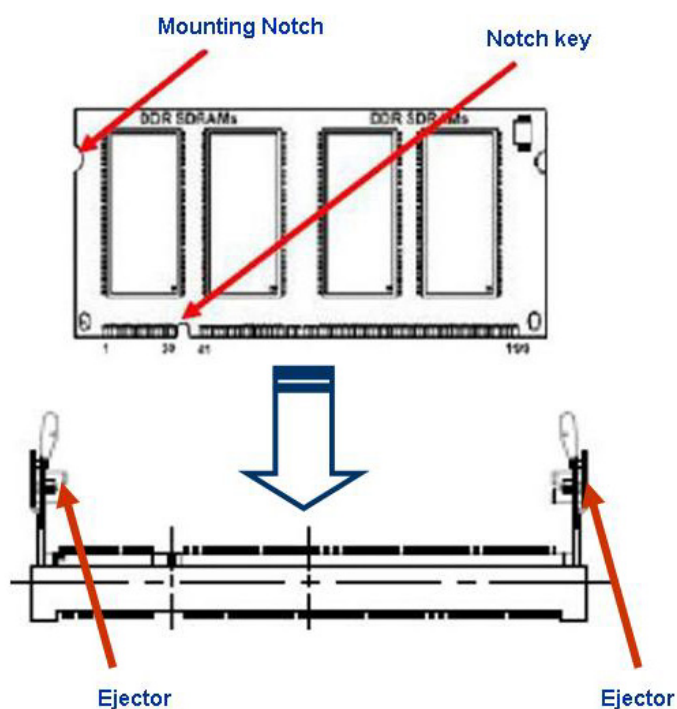
- A DDR2 SO-DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a SO-DIMM into a socket to avoid damaging the SO-DIMM.
- The DDR2 SO-DIMM sockets do not support DDR SO-DIMMs. DO NOT install DDR SO-DIMMs to the DDR2 SO-DIMM socket.

1.3.4 Removing a DDR2 SO-DIMM

1. Press the two ejector tabs on the slot outward simultaneously, and then pull out the SO-DIMM module.
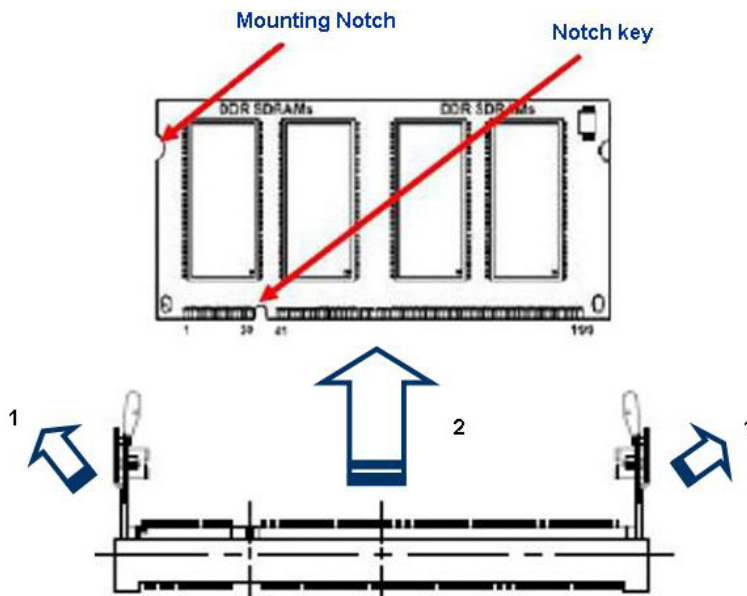
Support the SO-DIMM lightly with your fingers when pressing the ejector tabs. The SO-DIMM might get damaged when it flips out with extra force.

1.4 Expansion Slots

In the future, you may need to install expansion cards. The following sub‑sections describe the slots and the expansion cards that they support.

> Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.4.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.
2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.4.2 Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	-	Redirect to IRQ#9
3	11	IRQ holder for PCI streering*
4	12	Communications Port (COM1)*
5	13	IRQ holder for PCI streering*
6	14	Floppy Disk Controller
7	15	Printer Port (LPT)*
8	3	System CMOS/Real Time Clock
9	4	IRQ holder for PCI streeing*
10	5	IRQ holder for PCI streeing*
11	6	IRQ holder for PCI streeing*
12	7	PS/2 Compatible Mouse Port*
13	8	Numeric Data Processor
14	9	Primary IDE Channel
15	10	Secondary IDE Channel

* There IRQs are usually available for ISA or PCI device.

1.4.3 PCI Slots

IX45GM has one PCI slots. The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows a LAN card installed on a PCI slot.
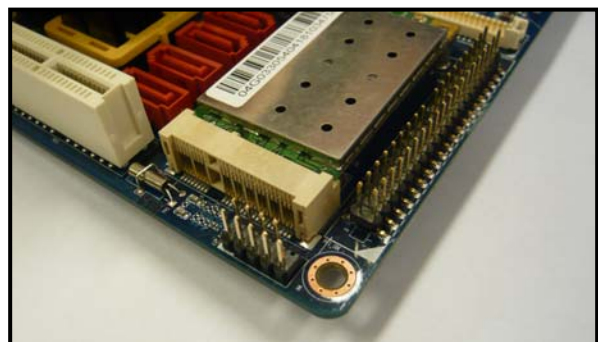

1.4.4 PCI Express x1

This motherboard supports PCI Express x1 network cards, SCSI cards and other cards that comply with the PCI Express specifications. The figure shows the type of network card that can be installed on the PCI Express x1 slot.
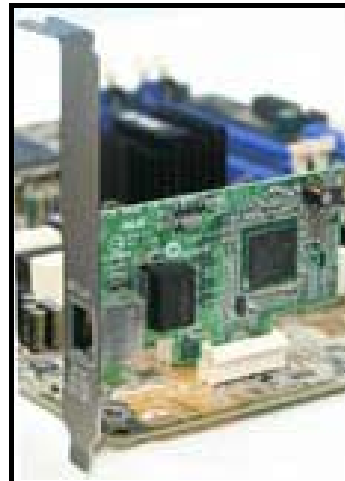
1.4.5 Mini PCI Express x 1

This motherboard supports Mini PCI Express wireless LAN, and TV tuner device.

1.5 Jumpers

1.5.1   Clear CMOS (CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords. To erase the RTC RAM:

1.   Turn OFF the computer and unplug the power cord.
2.   Remove the onboard battery.
3.   Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4.   Re-install the battery.
5.   Plug the power cord and turn ON the computer.
6.   Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

> Except when clearing the CMOS, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!
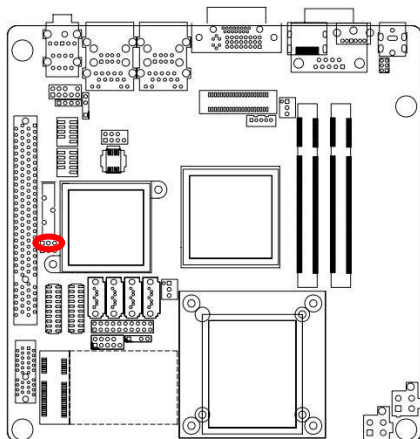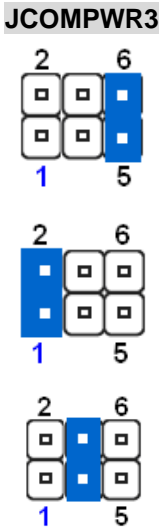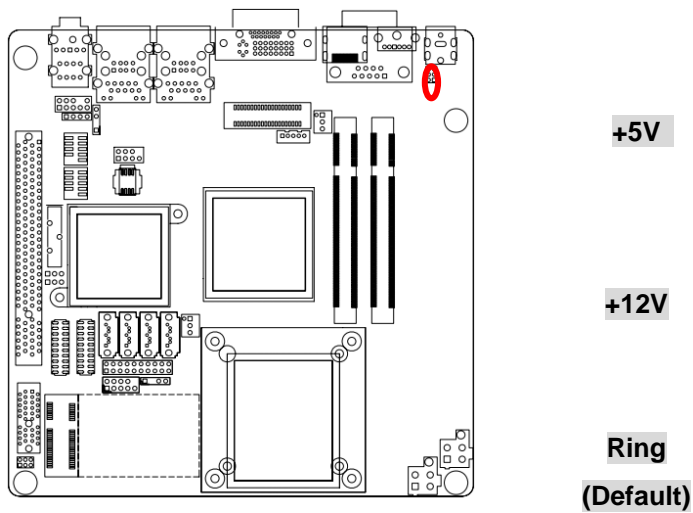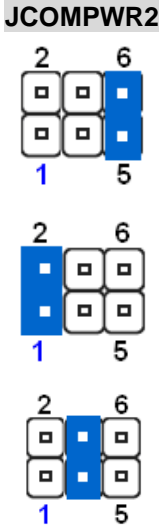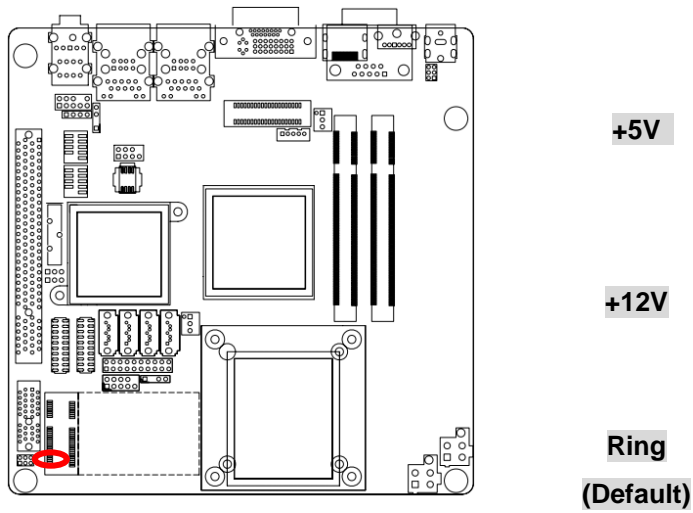

Normal (Default)

Clear RTC (CLRTC1)

1.5.2   COM1 RI/+5V/+12V Selection (JCOMPWR3)

+5V

+12V

Ring

(Default)
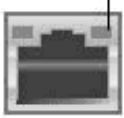
1.5.3   COM2 RI/+5V/+12V Selection (JCOMPWR2)

+5V

+12V

Ring

(Default)

1.6 Connectors

1.6.1   Rear Panel Connectors

No	Label	Function	Description
1	DC_IN1	DC Power In	19V ~ 24V
2	COM1	Serial port connector	D-sub 9-pin, male
3	VGA_DVI-D1	DVI port	Digital Visual Interface connector
4	LAN_USB1, LAN_USB2	LAN (RJ-45) connector	This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. The optional 10/100/1000 Mbps LAN controller allows 10/100/1000 Mbps connection to a Local Area Network (LAN) through a network hub.

ACT / LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Orange	Linked	ORANGE	100Mbps connection
Blinking	Data activity	GREEN	1Gbps connection
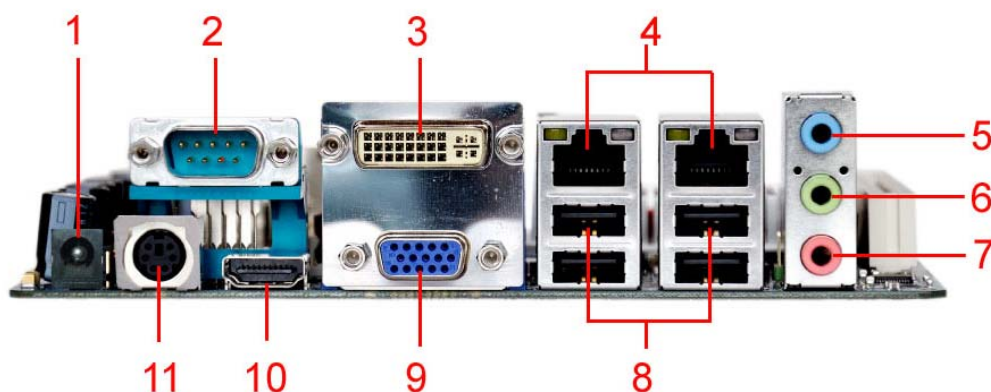
No	Label	Function	Description
5	AUDIO1	Line-In port (Light Blue).	This port connects a tape, CD, DVD player, or other audio sources.
6	AUDIO1	Line-Out port (Lime)	This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.
7	AUDIO1	Microphone port (Pink)	This port connects a microphone.
8	USB1, USB2	USB 2.0 connector	These four 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.
9	VGA_DVI-D1	VGA port	D-sub15-pin VGA port connects to a VGA monitor.
10	HDMI1	HDMI connector	High Definition Media Interface 19P connector
11	KBMS1	PS/2 Keyboard/Mouse connector	The standard PS/2 DIN connector is for a PS/2 Keyboard or mouse.

1.6.2 Amplifier Connector (JAMP1)

AMP_R+ AMP_R- AMP_L-
AMP_L+
1
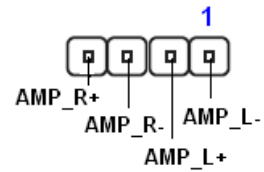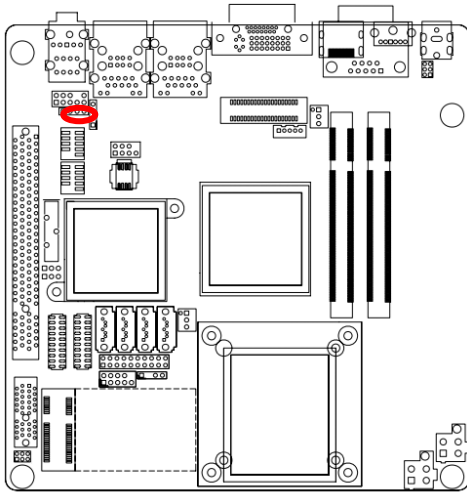
1.6.3 Serial Port 2-3 Connector (COM2,COM3)

DDCD2_N	DDSR2_N
RRXD2	RRTS2_N
TTXD2	CCTS2_N
DDTR2_N	RRI2_M
GND	GND
DDCD3_N	DDSR3_N
RRXD3	RRTS3_N
TTXD3	CCTS3_N
DDTR3_N	RRI3_N
GND	GND
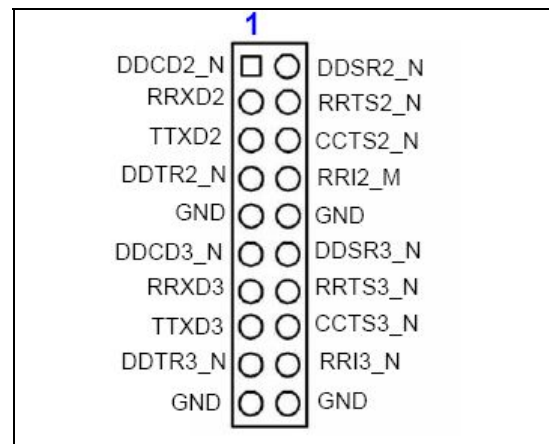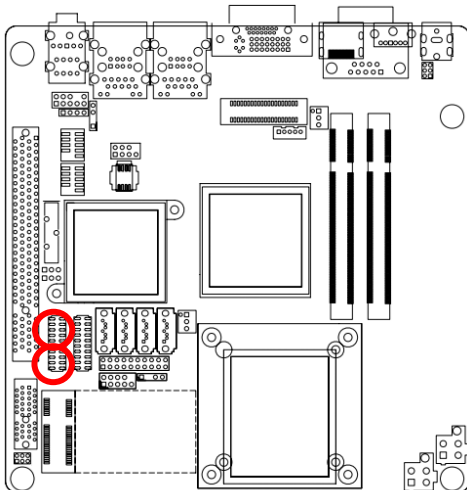
1.6.4 Serial Port 4-5 Connector (COM4,COM5)

DDCD2_N	DDSR2_N
RRXD2	RRTS2_N
TTXD2	CCTS2_N
DDTR2_N	RRI2_M
GND	GND
DDCD3_N	DDSR3_N
RRXD3	RRTS3_N
TTXD3	CCTS3_N
DDTR3_N	RRI3_N
GND	GND
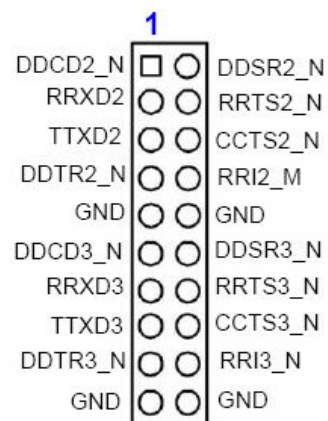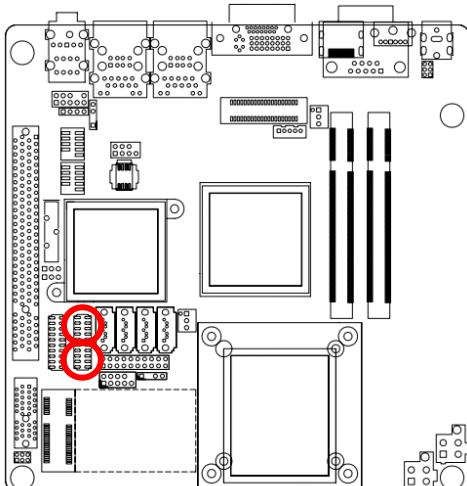
1.6.5 CPU Fan Connector (CPU_FAN1)
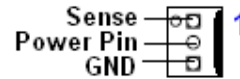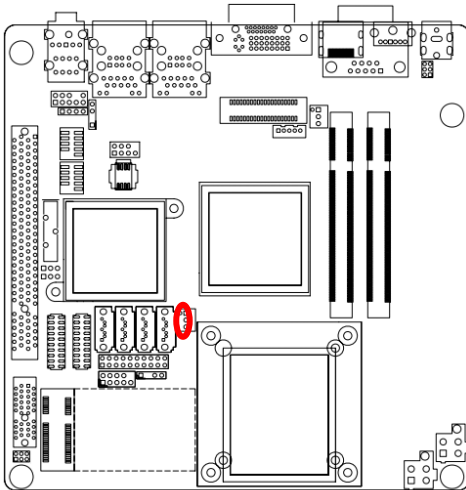

```
Sense ──────┐  1
Power Pin ──┤
GND ────────┘
```

⚠	• Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector. • These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.6.6 System Fan Connector (SYS_FAN1)
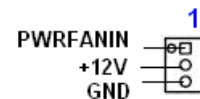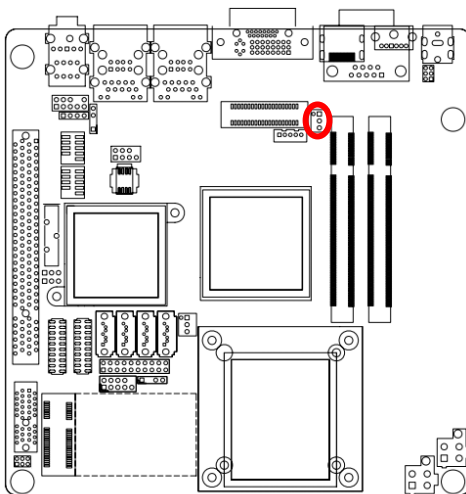

```
PWRFANIN ──┐  1
+12V ──────┤
GND ───────┘
```

⚠	• Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components, and hardware monitoring errors can occur if you fail to plug this connector. • These are not jumpers! DO NOT place jumper caps on the fan connectors.

1.6.7 System Panel Connector (FPIO1)

This connector supports several chassis-mounted functions.
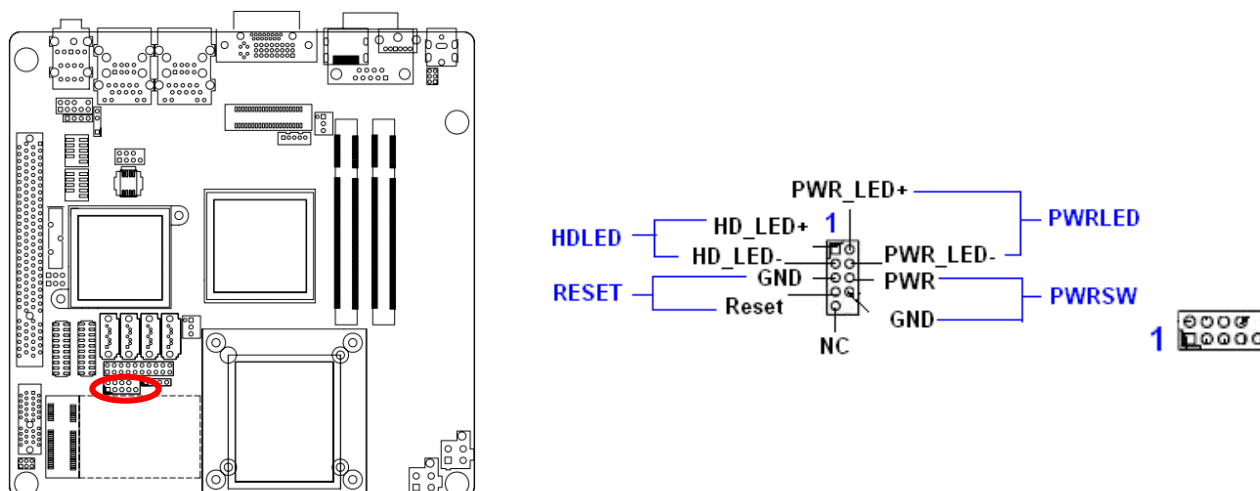
This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

1.6.8 Digital I/O Connector

+5V	GND
SMBDATA	SMBCLK
DIO_GP17	DIO_GP27
DIO_GP16	DIO_GP26
DIO_GP15	DIO_GP25
DIO_GP14	DIO_GP24
DIO_GP13	DIO_GP23
DIO_GP12	DIO_GP22
DIO_GP11	DIO_GP21
DIO_GP10	DIO_GP20

1
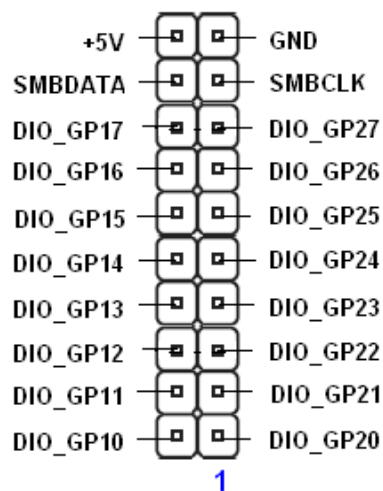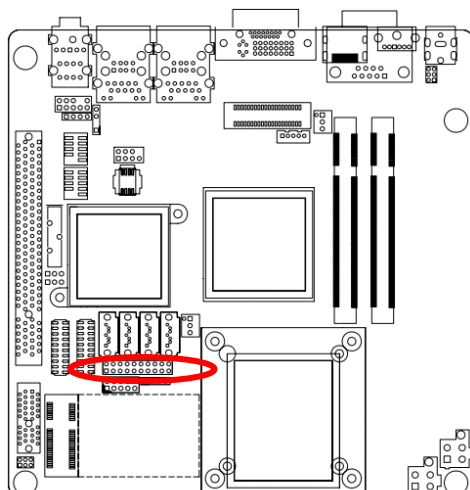
1.6.9 LVDS Connector (JLVDS1)

	1	
+5V		+3.3V
+5V		+3.3V
SD_DDC		SC_DDC
GND		GND
LVDS0_P0		LVDS0_P1
LVDS0_N0		LVDS0_N1
GND		GND
LVDS0_P2		LVDS0_P3
LVDS0_N2		LVDS0_N3
GND		GND
LVDS1_P0		LVDS1_P1
LVDS1_N0		LVDS1_N1
GND		GND
LVDS1_P2		LVDS1_P3
LVDS1_N2		LVDS1_N3
GND		GND
LVDS0_CLKP		LVDS1_CLKP
LVDS0_CLKN		LVDS1_CLKN
GND		GND
+12V	+12V	
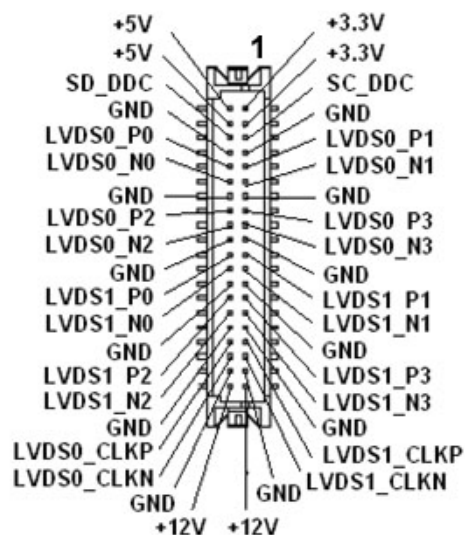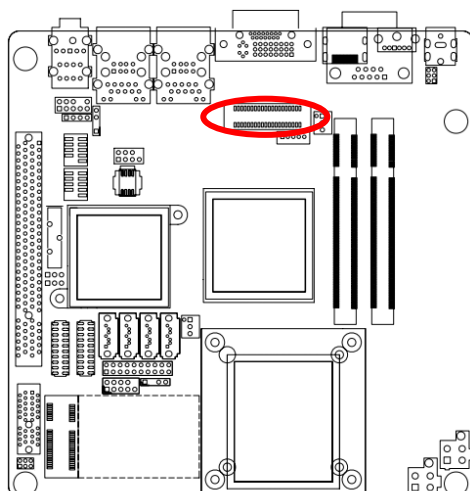
1.6.10 LCD Inverter Connector (JBKL1)
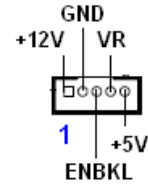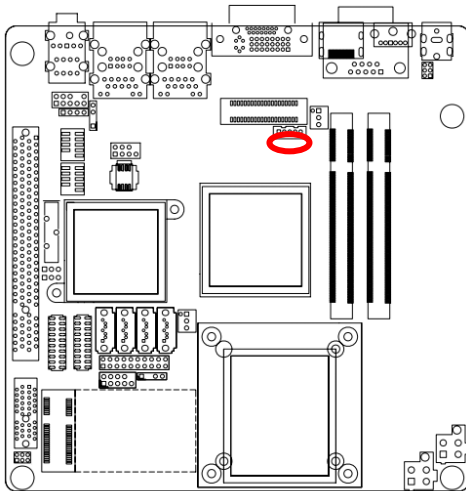
Signal	Signal Description
VR	Bright adjust. Vadj=0.75V ~ 4.25V (Recommended: 4.7KΩ, > 1/16W)
ENBKL	LCD backlight ON/OFF control signal

1.6.11 Chassis Intrusion Connector (CHASSIS1)

LCD Inverter Connector (JBKL1)
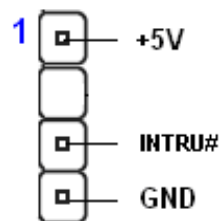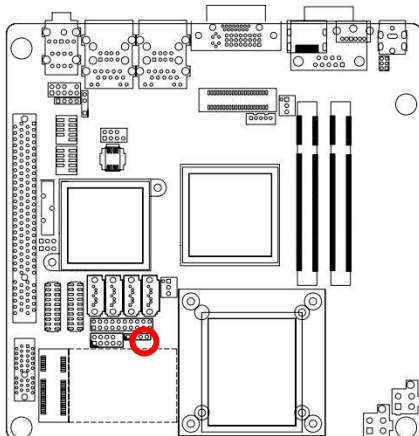
1.6.12 SPI Connector (JSPI1)
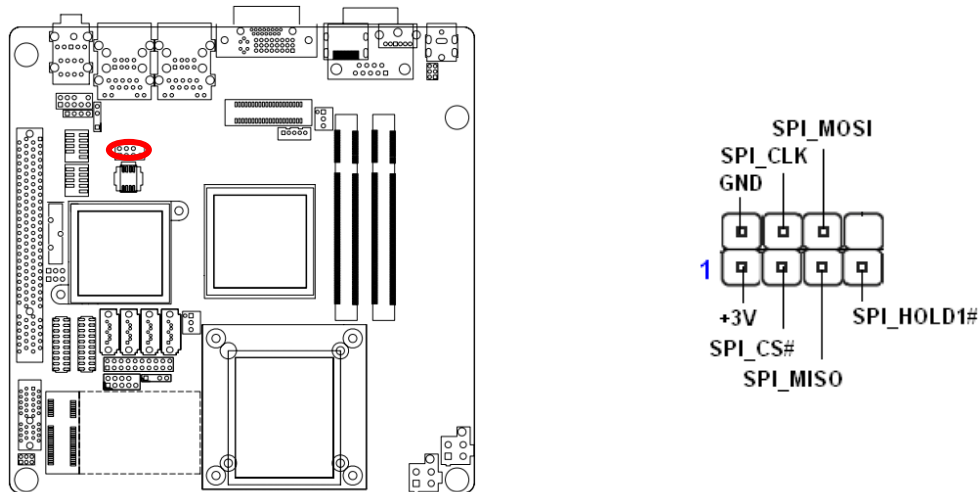
1.6.13 Digital Audio Connector (SPDIF_OUT1)

This connector is for an additional Sony/Philips Digital Interface (S/PDIF) port(s). Connect the S/PDIF module cable to this connector, then install the module to a slot opening at the back of the system chassis.
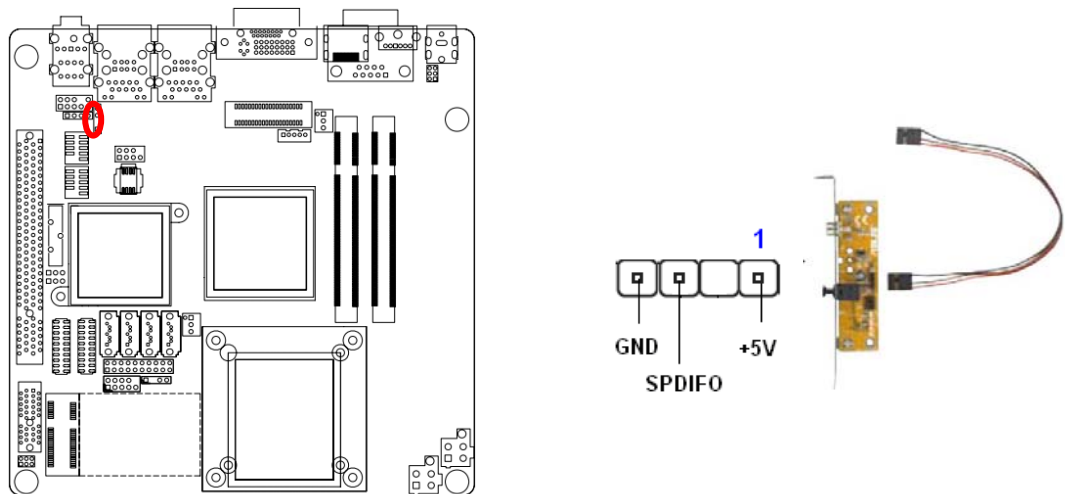
The S/PDIF module is purchased separately.

1.6.14 Serial SATA Connector (SATA1, SATA2, SATA3, SATA4)

SATA1
SATA_TXN1
GND | SATA_TXP1

GND

GND | SATA_RXN1
SATA_RXP1

SATA2
SATA_TXN2
GND | SATA_TXP2

GND

GND | SATA_RXN2
SATA_RXP2

SATA3
SATA_TXN3
GND | SATA_TXP3

GND

GND | SATA_RXN3
SATA_RXP3

SATA4
SATA_TXN4
GND | SATA_TXP4

GND

GND | SATA_RXN4
SATA_RXP4

SATA4   SATA1
SATA3 SATA2
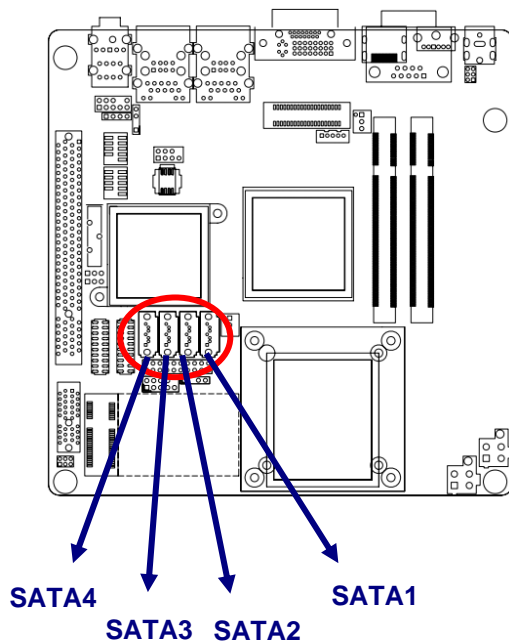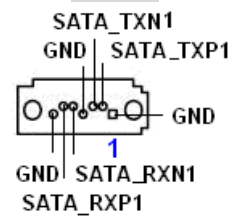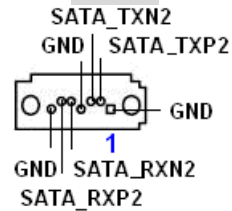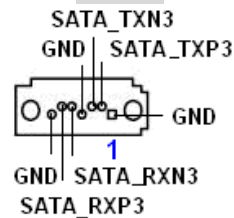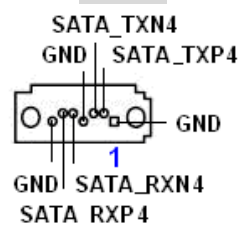
- Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 before using Serial ATA.
- When using the connectors in Standard IDE mode, connect the primary (boot) hard disk drive to the SATA1 connector.

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1.6.15 Serial SATA Power Connector (SATA_POWER1, SATA_POWER2)

These connectors provide power for SATA devices. Plug SATA Power Cable firmly then connect SATA power interface on hard drive or optical drive.

SATA Power1

GND ——— +12V
GND ——— +5V

SATA Power2

GND ——— +12V
GND ——— +5V

SATA_POWER2
SATA_POWER1
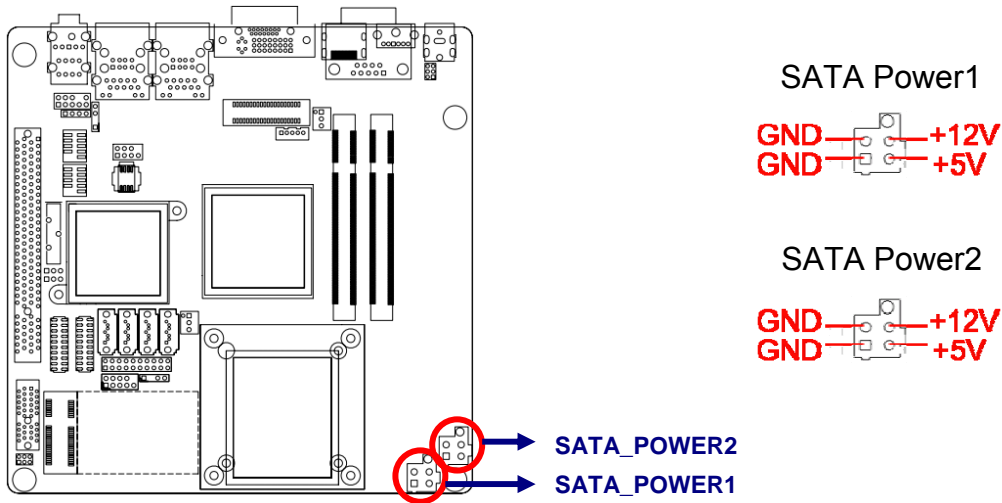
1.6.16 USB 2.0 Connector (USB1, USB2)

These connectors are for USB 2.0 ports. Connect the USB/GAME module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.

USB1

USB2

USB1

NC

GND ——— GND
LP7+ ——— LP6+
LP7- ——— LP6-
1

USB+5V USB+5V

USB2

NC

GND ——— GND
LP7+ ——— LP6+
LP7- ——— LP6-
1

USB+5V USB+5V
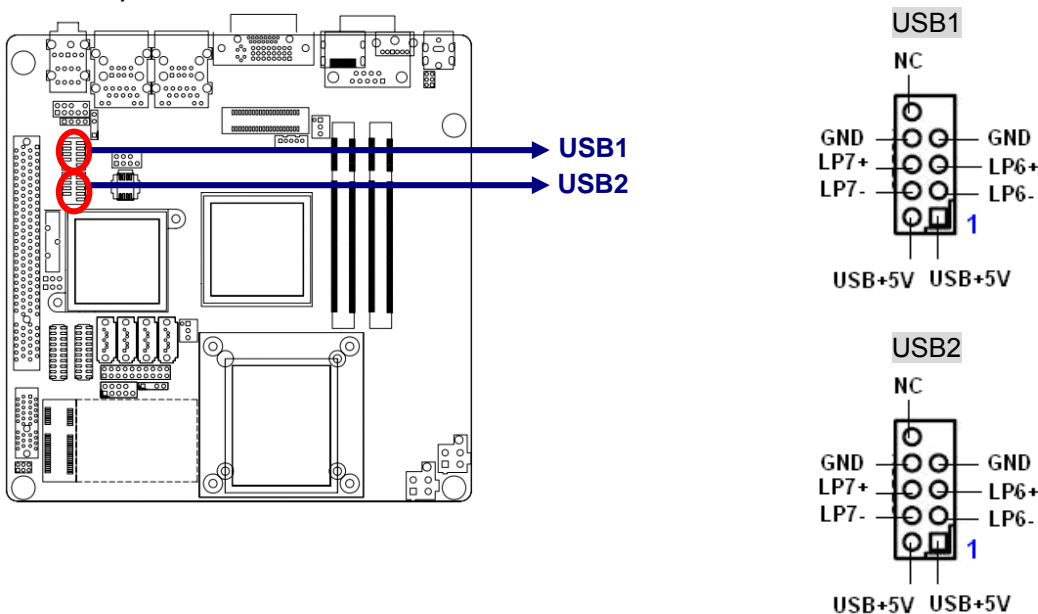
> Never connect a **1394 cable** to the USB connectors. Doing so will damage the motherboard!

> The USB module is purchased separately.

Chapter 2

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS Setup

2.1 BIOS setup program

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this user's guide.

The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. Options is blue can be.
The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white.
Often a text message will accompany it.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section "2.9 Exit Menu."
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the Advansus website to download the latest BIOS file for this motherboard.

2.1.1   Legend Box
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.
These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.
The keys in the legend bar allow you to navigate through the various setup menus.

Key(s)	Function Description
←, → Left/Right	The *Left and Right* <Arrow> keys allow you to select an setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑, ↓ Up/Down	The *Up and Down* <Arrow> keys allow you to select an setup item or sub-screen.
+, - Plus/Minus	The *Plus and Minus* <Arrow> keys allow you to change the field value of a particular setup item. For example: Date and Time.

Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the *General Help screen*.
	Press the <F1> key to open the *General Help screen*.
F10	The <F10> key allows you to save any changes you have made and exit Setup. Press the <F10> key to save your changes.
ESC	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

2.1.2 List Box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

2.1.3 Sub-menu

Note that a right pointer symbol (▶) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

2.2 Main Setup

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the *Main* tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.
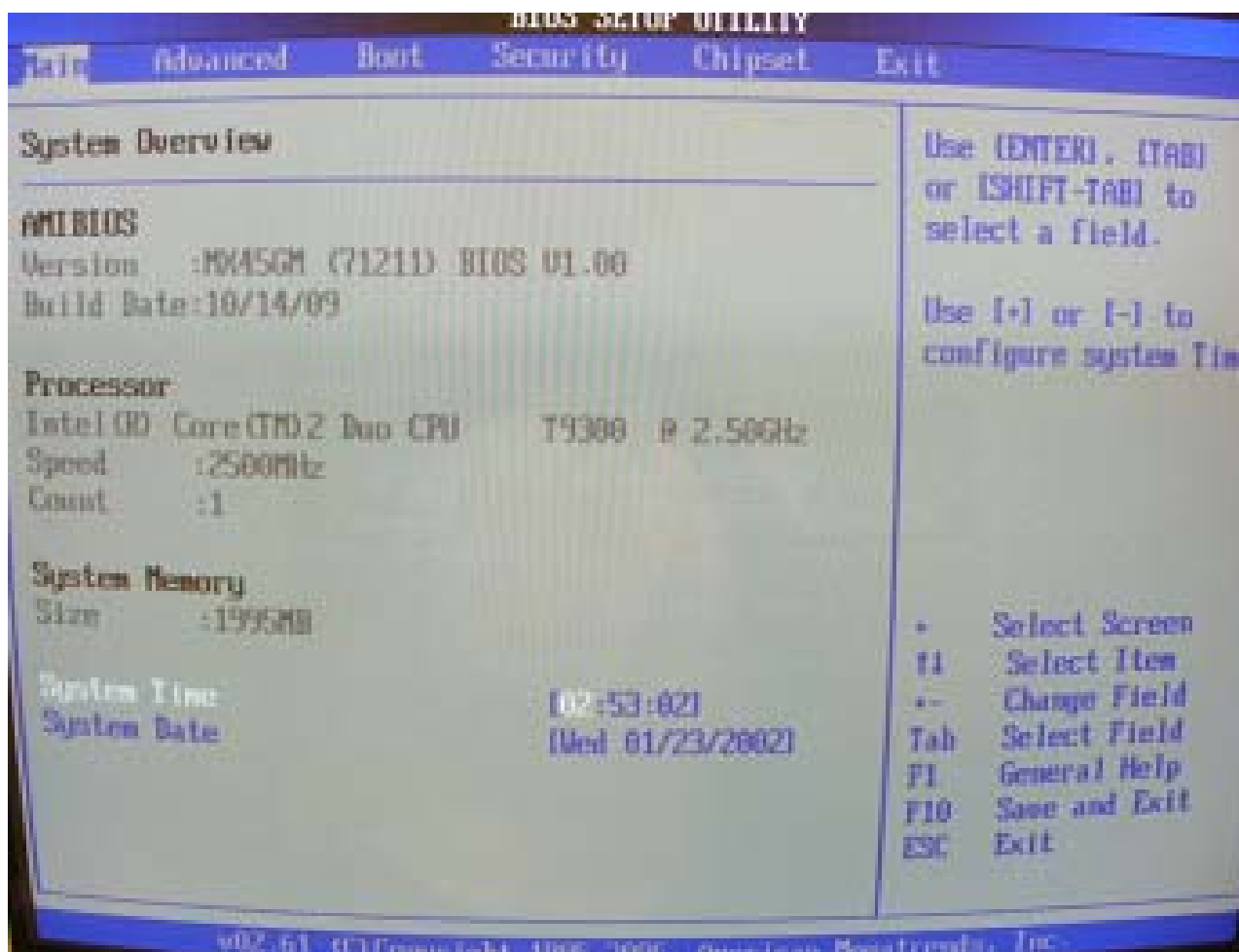
- **System Time/System Date**

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

> The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30P.M. as 17:30:00.

2.3 Advanced BIOS Setup

Select the *Advanced* tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below.

The sub menus are described on the following pages.

2.3.1 CPU Configuration Setting

You can use this screen to select options for the CPU Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages.
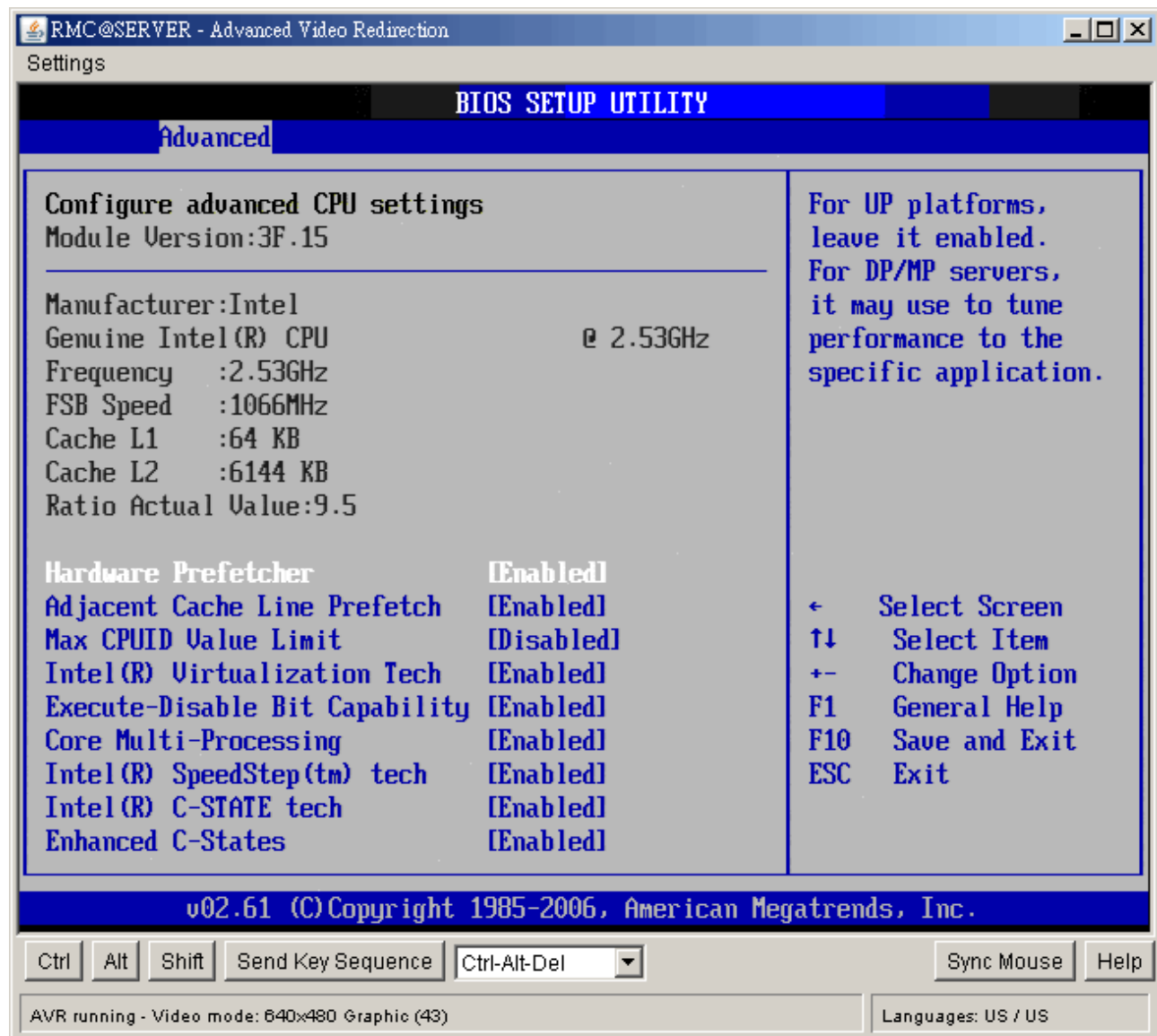
- **Hardware Prefetcher**

The choices of Hardware Prefetcher which prefetchs data from memory to L2 cache are Enabled (Default) .and Disabled.

- **Adjacent Cache Line Prefetch**

The choices of Adjacement Cache Line Prefetch which automatically fetches an extra 64-byte cache line are Enabled (Default), Disabled.

- **Max CPUID Value Limit**

The choices of Max CPUID Value Limit are Disabled (Default), and Enabled.

- **Intel® Virtualization Tech**

The choices of Intel® Virtualization Tech are Enabled (Default), Disabled.

- **Execute-Disable Bit Capability**

The choices of Execute-Disable Bit Capability are Enabled (Default), Disabled.

- **Core Multi-Processing**

The item is to enable (Default) or disable the Core Multi-processing function.

- **Intel® SpeedStep™ tech**

The choices of Execute-Disable Bit Capability are Enabled (Default), Disabled.

- **Intel® C-State tech**

The choices of Execute-Disable Bit Capability are Enabled (Default), Disabled.

- **Enhanced C-States**

The choices of Execute-Disable Bit Capability are Enabled (Default), Disabled.

2.3.2 IDE Configuration Setting

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages.
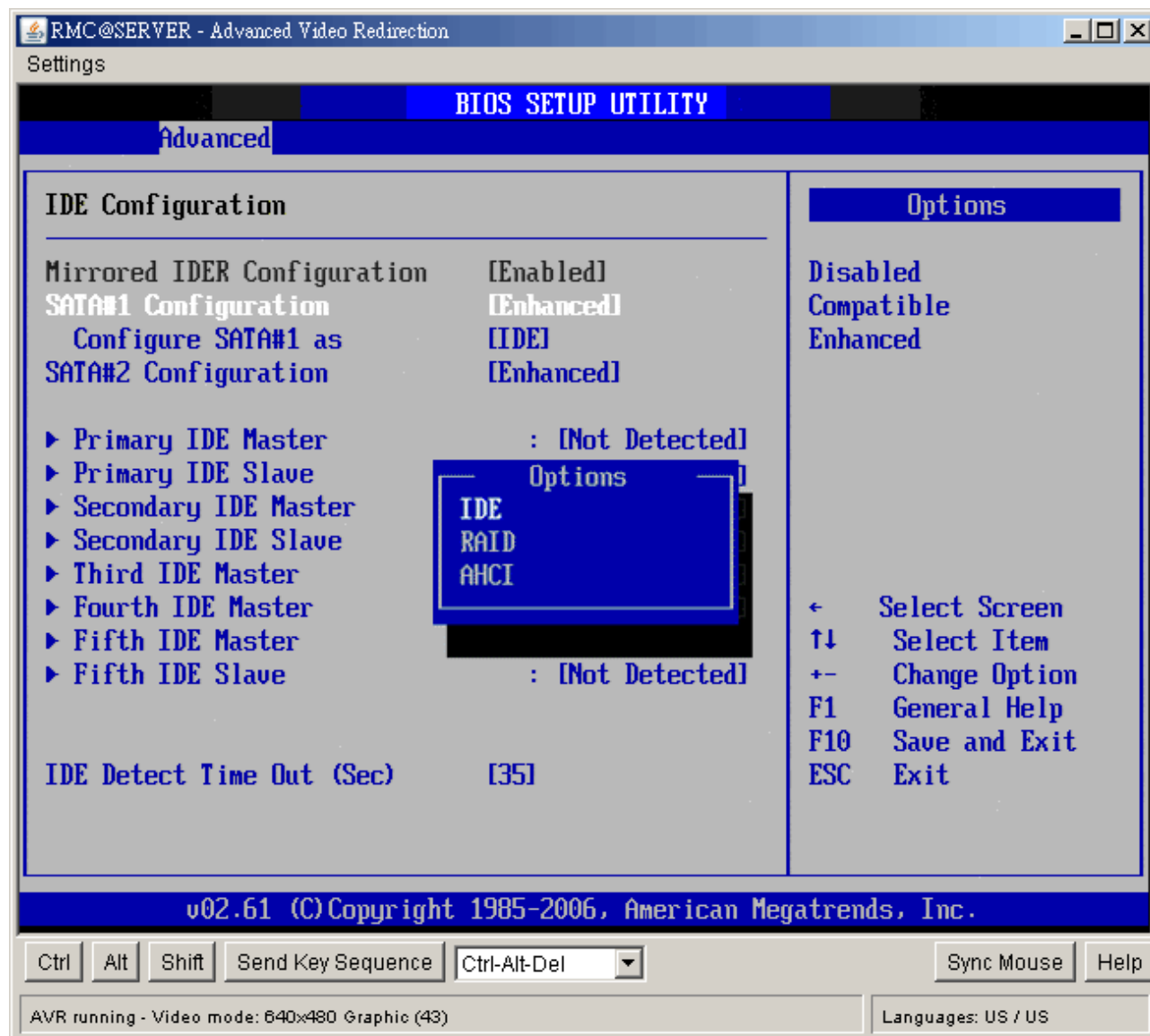
- **SATA#1 Configuration**

The choices of SATA configuration are Disabled, Compatible, and Enhanced (Default).

- **Configure SATA #1 as**

This item allows to configure SATA as IDE (Default), RAID, or AHCI.

- **SATA#2 Configuration**

The choices of SATA configuration are Disabled and Enhanced (Default).

- **Primary/Secondary IDE Master/Slave, Third/Fourth IDE Master, Fifth IDE Master/Slave**

  Select one of the hard disk drives to configure it. Press <Enter> to access its the sub menu. The options on the sub menu are described in the following sections.

- **IDE Detect Time Out (Sec)**

Set this option to stop the AMIBIOS from searching for IDE devices within the specified number of seconds. Basically, this allows you to fine-tune the settings to allow for faster boot times. Adjust this setting until a suitable timing that can detect all IDE disk drives attached is found.

The default setting is *35*.

Option	Description
0	This value is the best setting to use if the onboard IDE controllers are set to a specific IDE disk drive in the AMIBIOS.
5	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in five seconds. A large majority of ultra ATA hard disk drives can be detected well within five seconds.
10	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in 10 seconds.
15	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in 15 seconds.
20	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in 20 seconds.
25	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in 25 seconds.
30	Set this value to stop the AMIBIOS from searching the IDE bus for IDE disk drives in 30 seconds.
35	35 is the default value. It is the recommended setting when all IDE connectors are set to AUTO in the AMIBIOS setting.

Different IDE disk drives take longer for the BIOS to locate than others do.

2.3.3 Super I/O Configuration

You can use this screen to select options for the Super I/O settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.

- **Serial Port1 Address**

This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is *3F8/IRQ4*.

Option	Description
Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable.
3F8/IRQ4	Set this value to allow the serial port to use 3F8 as its I/O port address and IRQ4 for the interrupt address. This is the default setting. The majority of serial port 1 or COM1 ports on computer systems use IRQ4 and I/O Port 3F8 as the

	standard setting. The most common serial device connected to this port is a mouse. If the system will not use a serial device, it is best to set this port to Disabled.

- **Serial Port2 Address**

This option specifies the base I/O port address and Interrupt Request address of serial port 2. The Optimal setting is *2F8/IRQ3*.

Option	Description
Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable.
2F8/IRQ3	Set this value to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. This is the default setting. The majority of serial port 2 or COM2 ports on computer systems use IRQ3 and I/O Port 2F8 as the standard setting. The most common serial device connected to this port is an external modem. If the system will not use an external modem, set this port to *Disabled*. Most internal modems require the use of the second COM port and use 3F8 as its I/O port address and IRQ 4 for its interrupt address. This requires that the Serial Port2 Address be set to *Disabled* or another base I/O port address and Interrupt Request address.

- **Serial Port3 Address**

This option specifies the base I/O port address of serial port 3. The Optimal setting is *3E8*.

- **Serial Port3 IRQ**

This option specifies the Interrupt Request address of serial port 3. The Optimal setting is *10*.

Option	Description
Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable.
3E8/IRQ10	Set this value to allow the serial port to use 3E8 as its I/O port address and IRQ10 for the interrupt address. This is the default setting. If the system will not use a serial device, it is best to set this port to Disabled.

- **Serial Port4 Address**

This option specifies the base I/O port address of serial port 4. The Optimal setting is *2E8*.

- **Serial Port4 IRQ**

This option specifies the Interrupt Request address of serial port 4. The Optimal setting is *11*.

Option	Description
Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable.
2E8/IRQ11	Set this value to allow the serial port to use 2E8 as its I/O port address and IRQ11 for the interrupt address. This is the default setting. If the system will not use a serial device, it is best to set this port to Disabled.

- **Serial Port5 Address**

This option specifies the base I/O port address of serial port 5. The Optimal setting is *2E0*.

- **Serial Port5 IRQ**

This option specifies the Interrupt Request address of serial port 5. The Optimal setting is *5*.

Option	Description
Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to *Disabled*, the serial port physically becomes unavailable.
2E0/IRQ5	Set this value to allow the serial port to use 2E0 as its I/O port address and IRQ5 for the interrupt address. This is the default setting. If the system will not use a serial device, it is best to set this port to Disabled.

- **Watch Dog Timer Control**

This option Enabled, Disabled (Default) Watch Dog Timer.

2.3.4 Hardware Health Configuration

You can use this screen to select options for the Hardware Health settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.
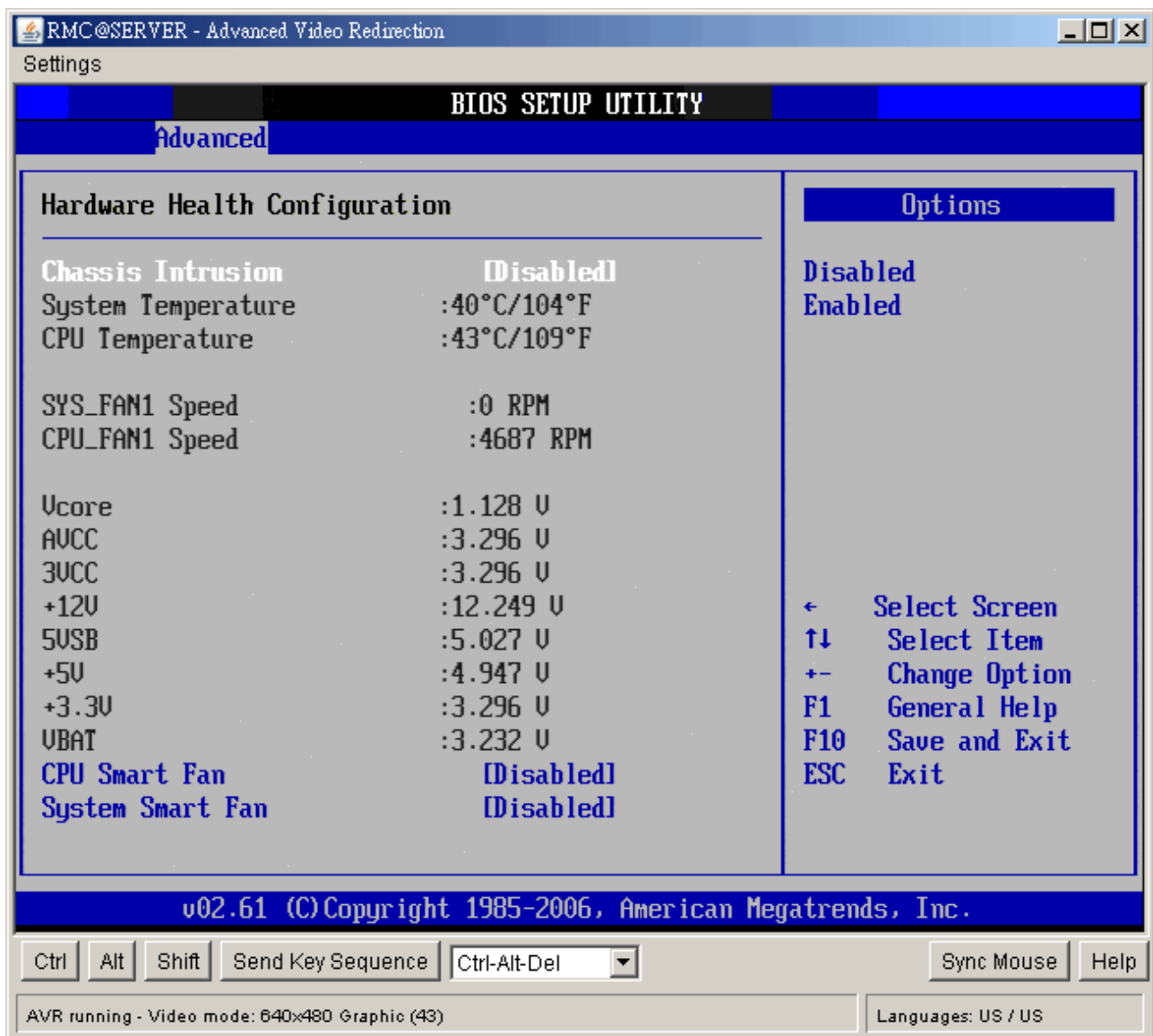
- **Chassis Intrusion**

     This item selects the chassis intrusion. The choices are Disabled or Enabled.
- **System Temperature**

This shows you the current temperature of system.
- **CPU Temperature**

This shows you the current CPU temperature.
- **SYS_FAN Speed**

This shows the current System FAN operating speed.

- **CPU_FAN Speed**

This shows the current CPU FAN operating speed.

- **Vcore/ 3VCC/ +12V/ +5V/ 5VSB/ 3VSB/ VBAT**

This shows the voltage of VCORE, 3VCC, +12V, +5V, 5VSB(V), 3VSB(V) and VBAT(V).

- **CPUFAN1 Mode Setting, SYSFAN1 Mode Setting**

This item enables or disables the Smart Fan feature. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU temperature to prevent your system from overheating.

- Available options are: [Manual Mode], [Thermal Cruise Mode], [Speed Cruise Mode].

[Manual Mode] (Default)

▶ **CPUFAN1 PWM Control, SYSFAN1 PWM Control**

This setting allows users to control the fan speed by changing the duty cycle of the fan PWM (Pulse-Width Modulation) output.

[Thermal Cruise Mode]

▶ **CPUFAN1 TargetTemp Value, SYSFAN1 TargetTemp Value**

Select a temperature setting here, and if the temperature of the CPU climbs up to the selected temperature setting, the system will automatically increase the speed of the CPU/system fan to cool down the overheated CPU.

▶ **CPUFAN1 Tolerance Value, SYSFAN1 Tolerance Value**

You can select a fan tolerance value here for the specific range for the "CPUFAN1/SYSFAN1 TargetTemp Value" items. If the current temperatures of the 3 fans reach to the maximum threshold (the temperatures set in the "CPUFAN1/SYSFAN1 TargetTemp Value" plus the tolerance values you set here), the fans will speed up for cooling down. On the contrary, if the current temperatures reach to the minimum threshold (the set temperatures minus the tolerance values), the fans will slow down to keep the temperatures stable.

▶ **CPUFAN1/SYSFAN1 StartUp Value, CPUFAN1/SYSFAN1 Stop Value**

Use these settings to select the startup/stop temperature value for the CPUFAN1 &SYSFAN1.

▶ **CPUFAN1/SYSFAN1 Stop Time Value**

Use these settings to select the stop time value for the CPUFAN1 & SYSFAN1.

[Speed Cruise Mode]

> ▶ **CPUFAN1 TargetSpeed Value, SYSFAN1 TargetSpeed Value,**

Select a fan speed setting here, and if the fan speed of the CPU/system fans climbs up to the selected fan speed setting, the system will automatically increase the speed of the CPU/system fan to cool down the overheated CPU.

> ▶ **CPUFAN1 Tolerance Value, SYSFAN1 Tolerance Value**

You can select a fan tolerance value here for the specific range for the "CPUFAN1/SYSFAN1/SYSFAN2 TargetSpeed Value" items. If the current fan speed reach the maximum threshold (the fan speed set in the "CPUFAN1/ SYSFAN1 TargetSpeed Value" plus the tolerance values you set here), the fans will speed up for cooling down. On the contrary, if the current fan speed reach to the minimum threshold (the set fan speeds minus the tolerance values), the fans will slow down to keep the temperatures stable.

2.3.5 ACPI Configuration

You can use this screen to select options for the ACPI settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.
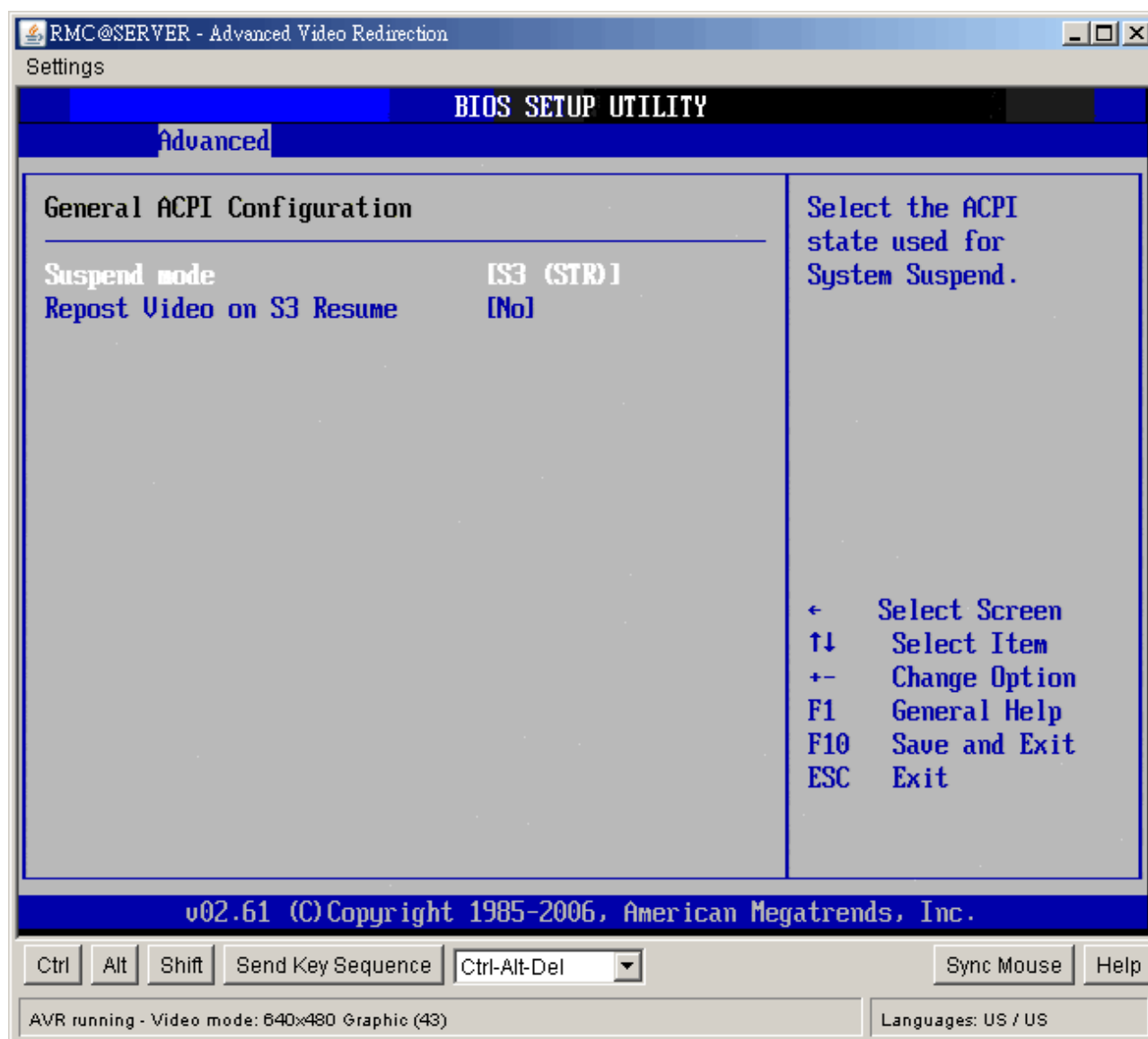

- **General ACPI Configuration**

This item allows you to set general ACPI Configuration.
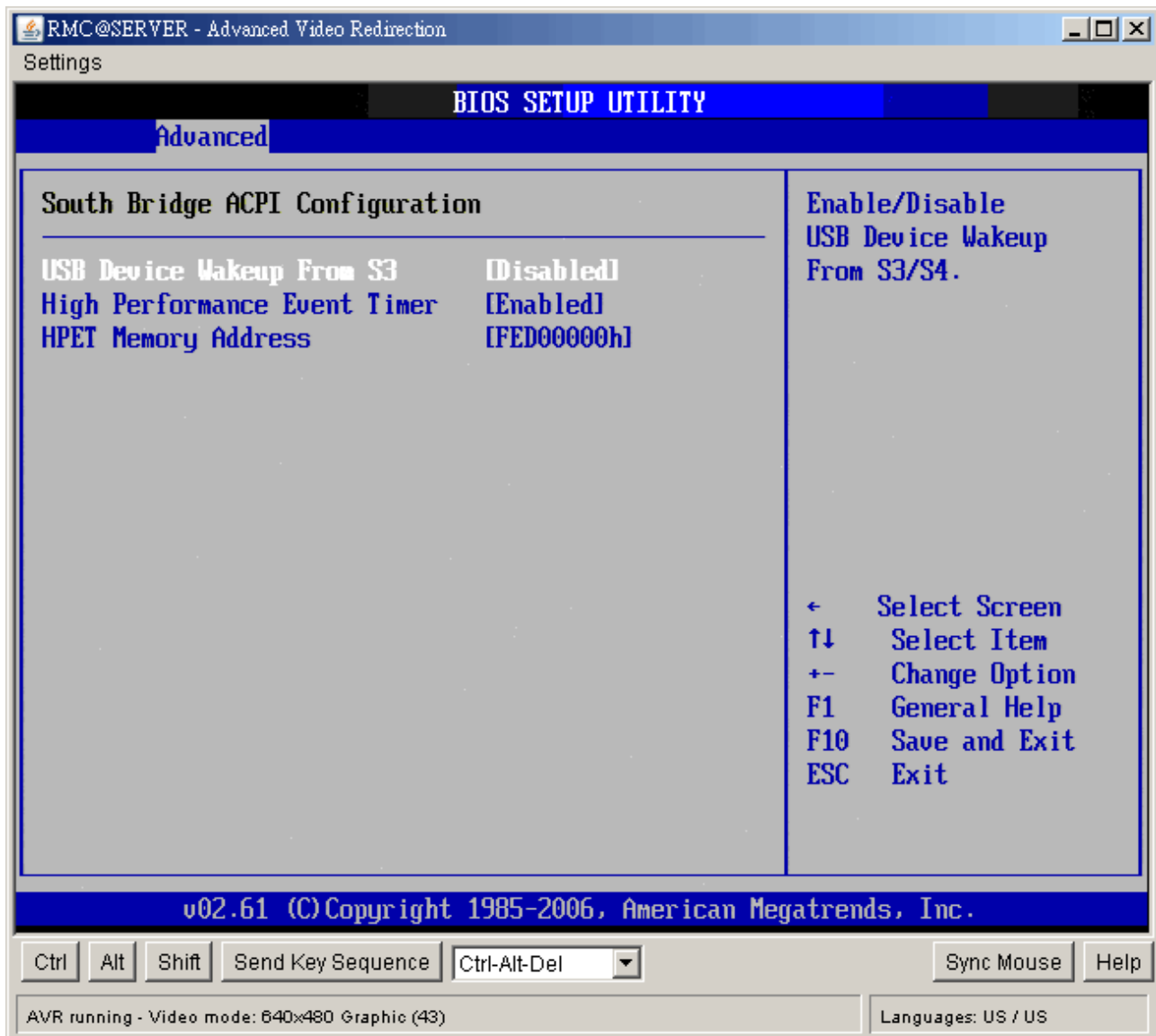
- **Chipset ACPI Configuration**

This item allows you to set South Bridge ACPI Configuration.

The item allows you to select the suspend type under the ACPI operating system.

Option	Description
S1 (POS)	Power on Suspend
S3 (STR)	Suspend to RAM (Default)
Auto	POS+STR

Determines whether to invoke VGA BIOS post on S3/STR resume. The choices are No or Yes.

- **USB Device Wakeup From S3**
  This item allows you to enable or disabled (Default) the USB resume from S3/S4 status.

- **High Performance Event Timer**
  This item allows you to enable or disable (Default) the High Performance Event Timer.

- **HPET Memory Address**
  This item allows you to allot the Event Timer Block Registers Base Address to the memory.

2.3.6   AHCI Configuration

You can use this screen to select options for the AHCI settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.
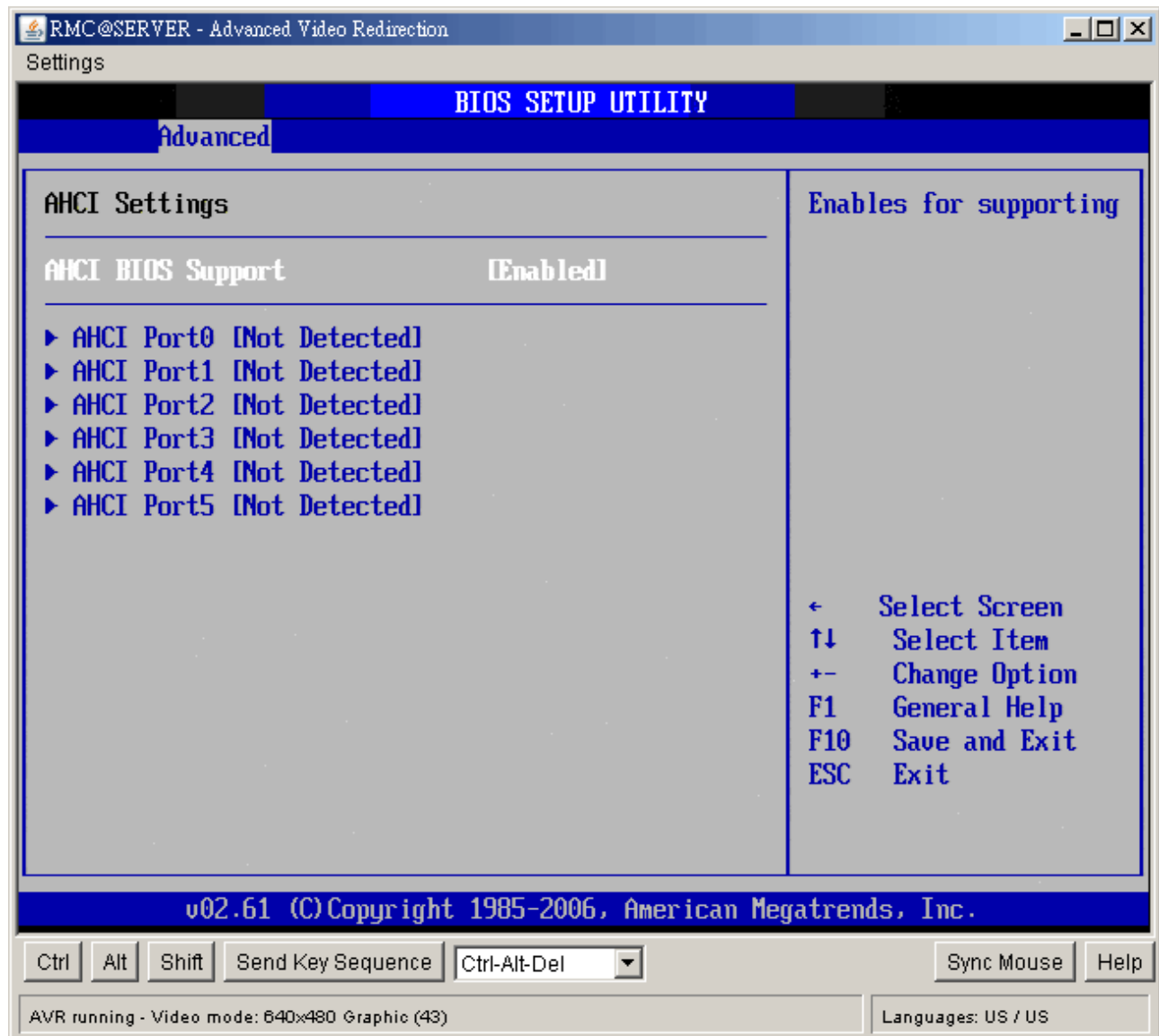
- **AHCI BIOS Support**

This BIOS feature controls the AHCI function of SATA controller. The choice are Enabled (Default) / Disabled

- **Device**

This area shows the detected connected device.

- **SATA Port0/1/2/3/4/5**

This item allows you to select the connected device type. Options: Auto (Default)

- **S.M.A.R.T.**

This item allows you to control the device S.M.A.R.T function. The options are Enabled
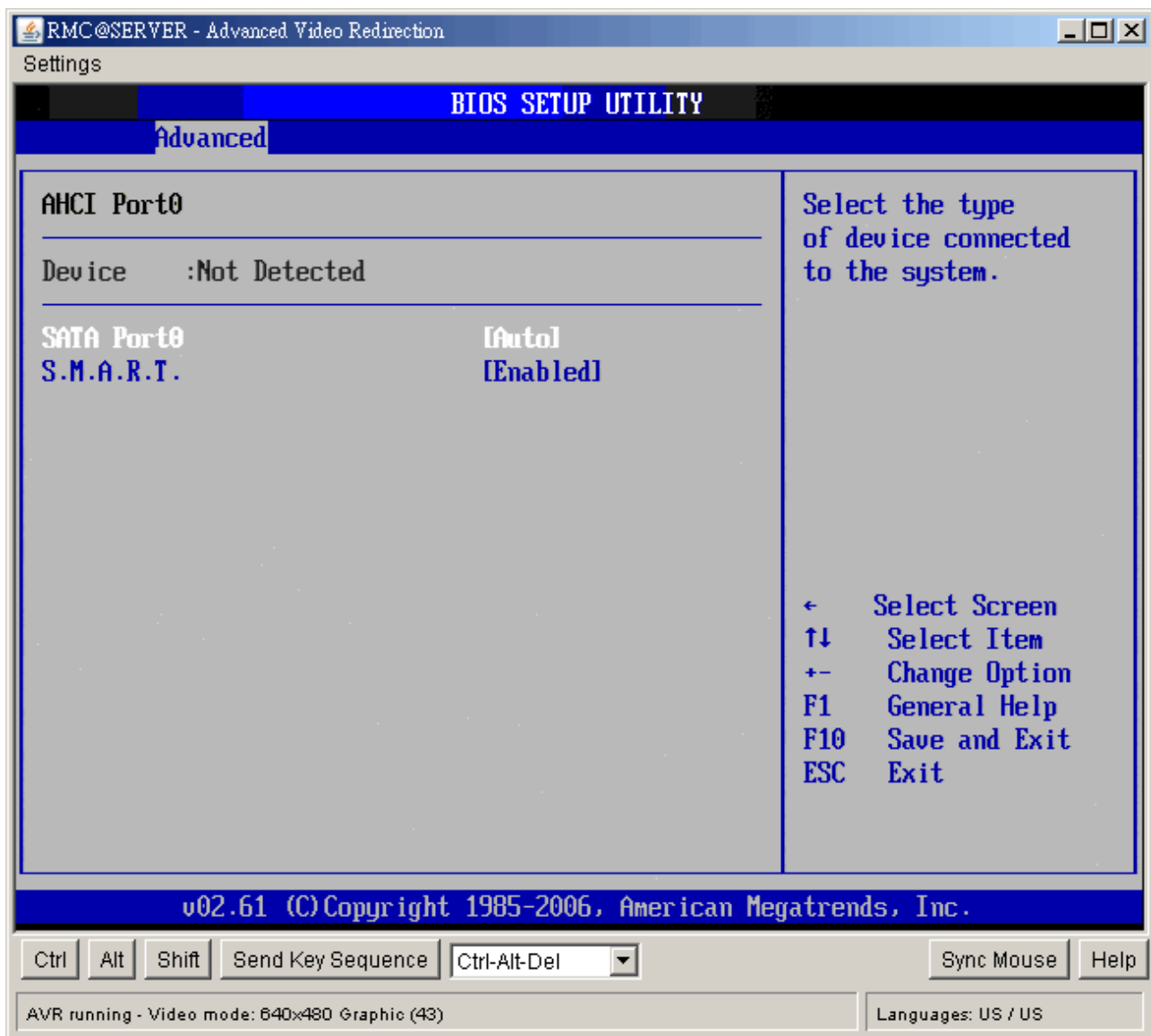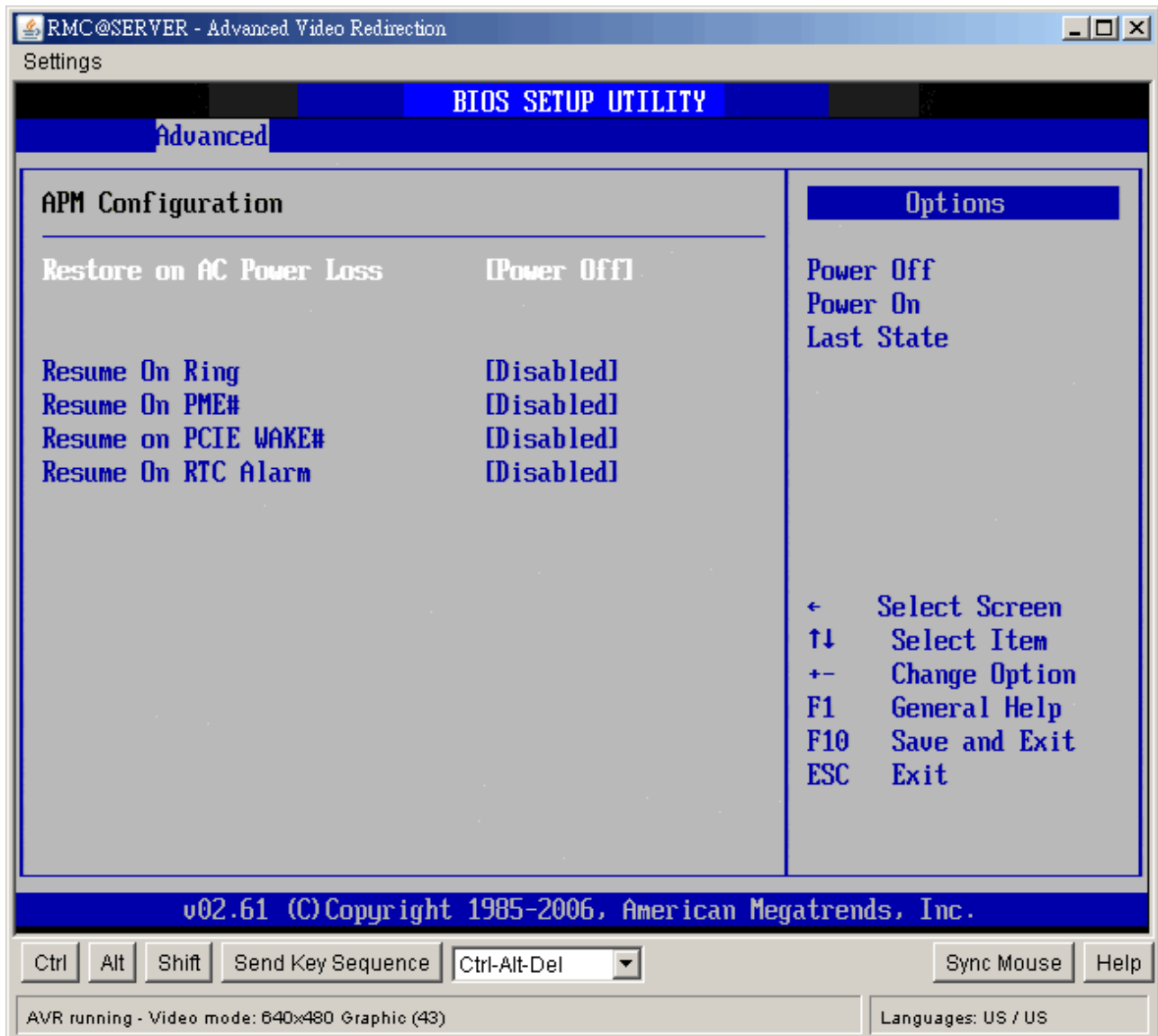(Default) / Disabled

2.3.7   APM Configuration

You can use this screen to select options for the APM settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.

- **Restore on AC Power Loss**

This item allows you to set AC Power Loss to Power Off (Default), Power On, or Last State.

- **Resume On Ring**

Disable (Default) or Enable RI to generate a wake event.

- **Resume On PME#**

Disable (Default) or Enable PME to generate a wake event.

- **Resume On PCIE WAKE#**

Disable (Default) or Enable PCIE to generate a wake event.

- **Resume RTC Alarm**

Disable (Default) or Enable RTC to generate a wake event.

2.3.8 Intel AMT Configuration

You can use this screen to select options for Intel AMT settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.
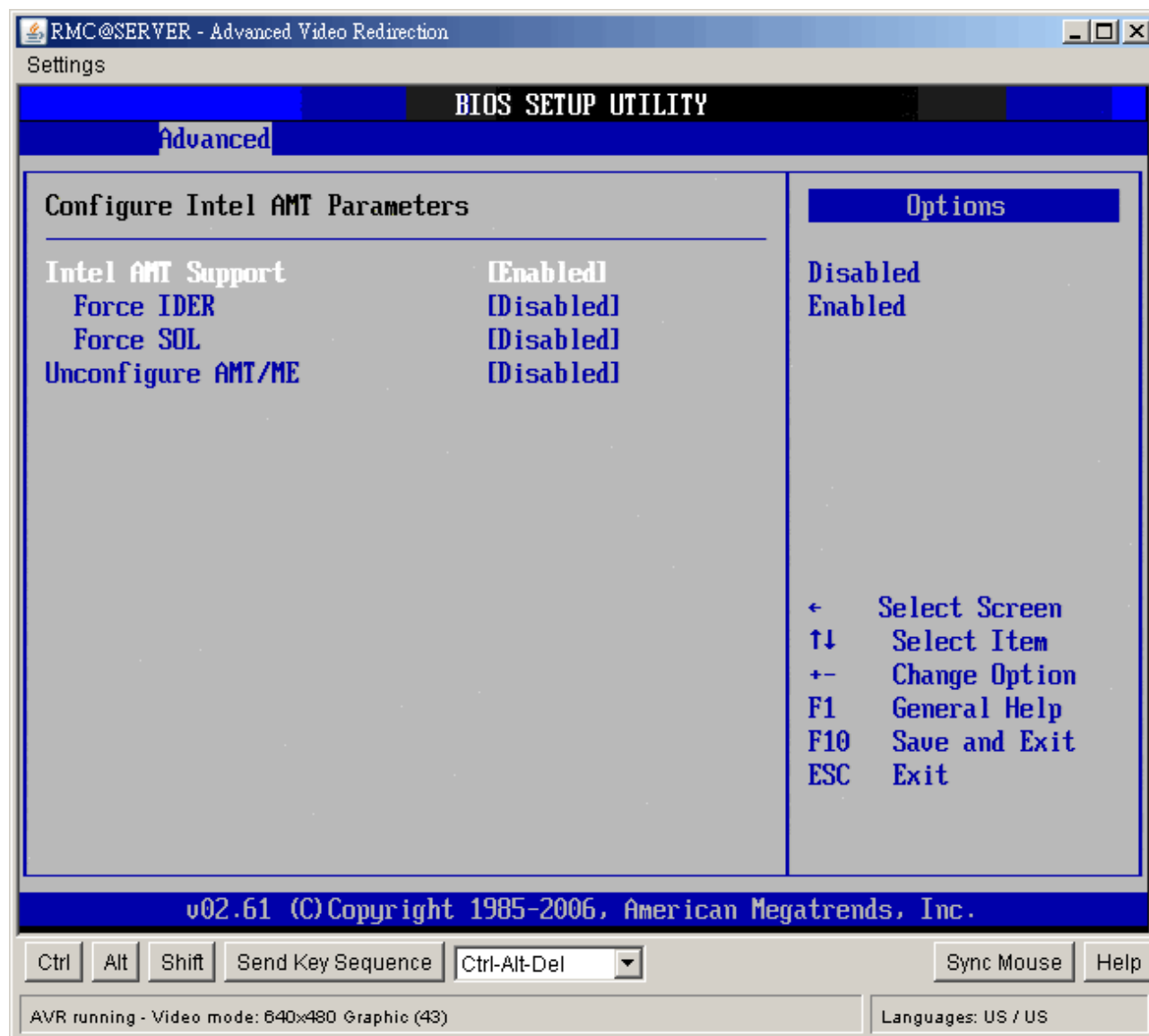
- **Intel AMT Support**

Intel Active Management Technology (AMT) is hardware-based technology for remotely managing and securing PCs out-of-band. The options are Disabled (Default), Enabled

- **Force IDE/Force SOL**

SOL/ IDER (Serial Over LAN/ IDE-Redirection) is a protocol defined for Intel Active Management Technology that allows redirecting the keyboard/text or floppy disk/CD transfers from a local host to a remote workstation.

- **Unconfigure AMT/ME**

To finish the unconfiguration of AMT, set this setting to [Enabled] and the BIOS will unconfigure all of AMT/ME settings and all the passwords are reset.

2.3.9 Intel TXT (LT) Configuration

You can use this screen to select options for the Intel TXT (LT) settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.   The screen is shown below.
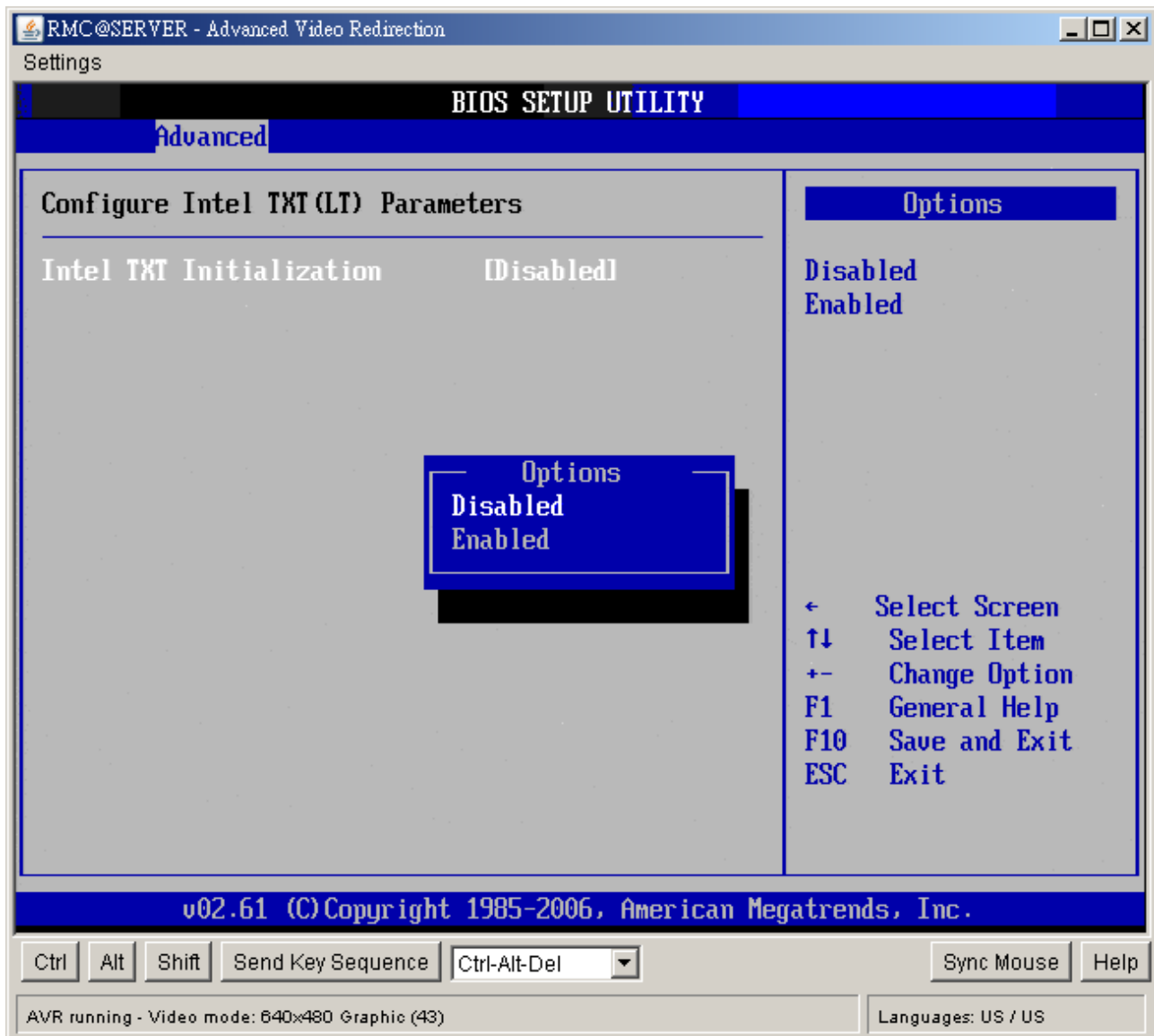
- **Intel TXT Initialization**

The Choices are enabled or disabled (Default) the Intel TXT initialization.

2.3.10 Intel VT-d Configuration

You can use this screen to select options for the Intel VT-d settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The screen is shown below.

- **Intel VT-d**

The Choices are enabled or disabled (Default) the Intel VT-d.

2.3.11 Trusted Computing

You can use this screen to select options for the Intel Trusted Computing settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.   The screen is shown below.
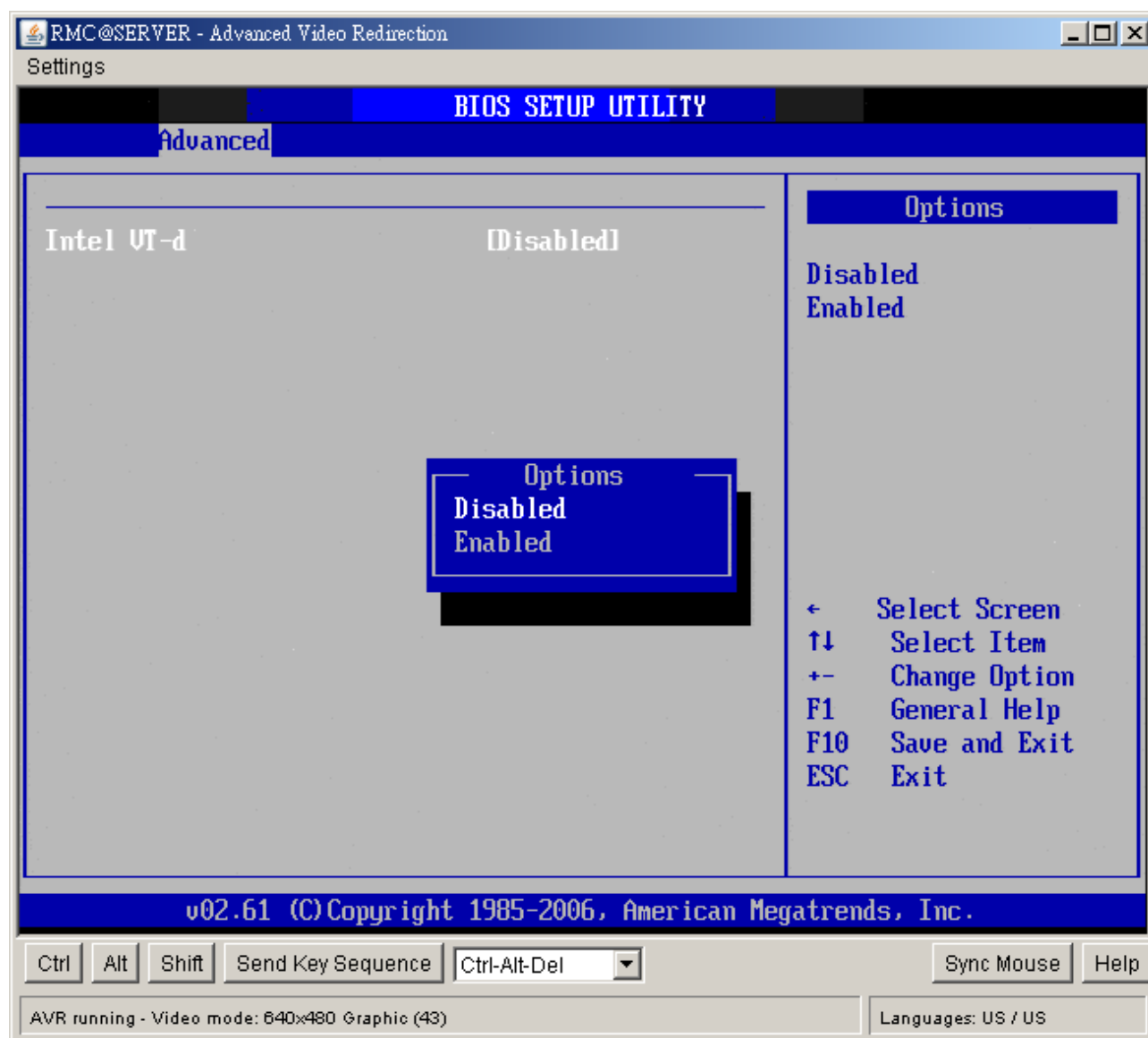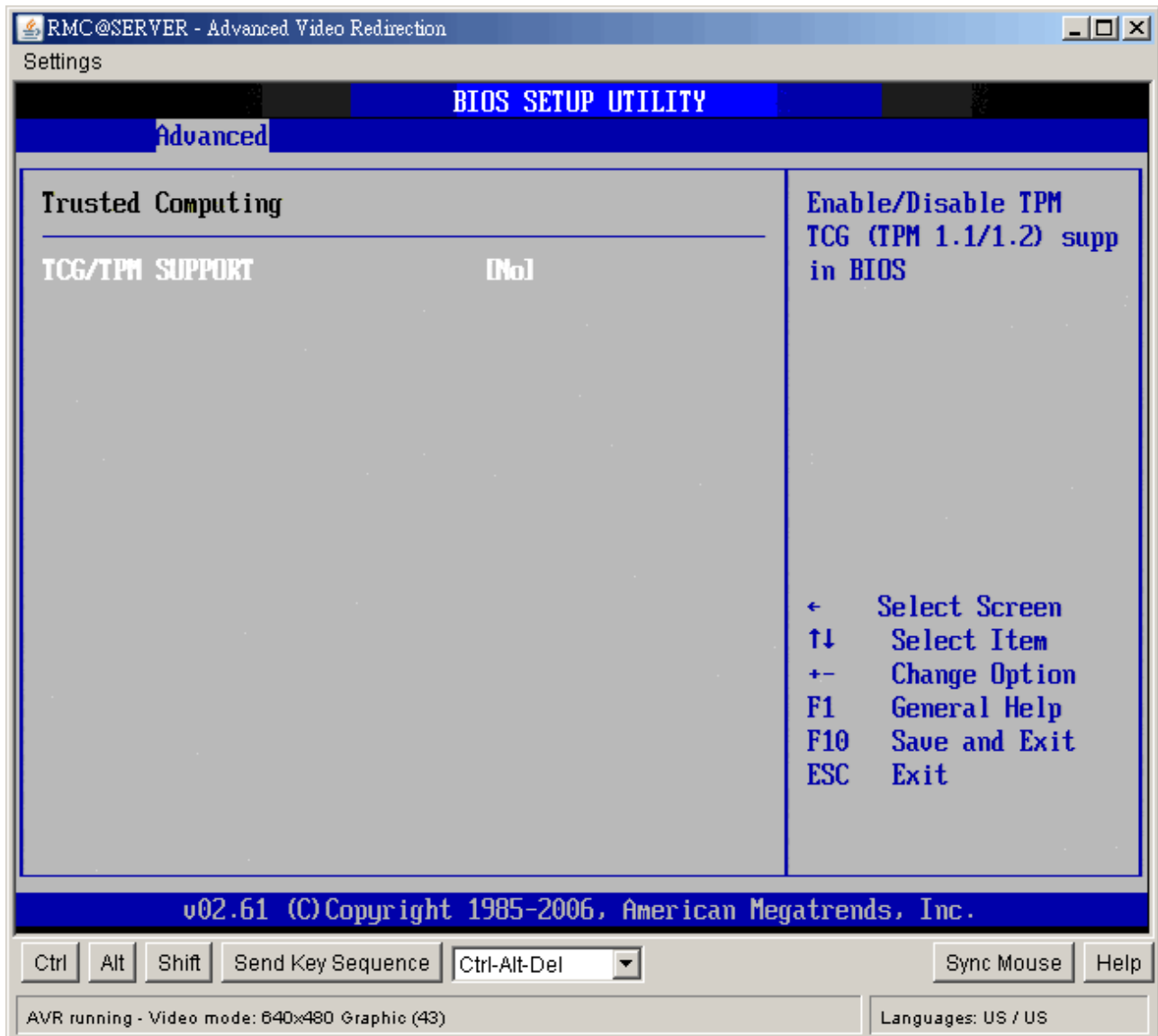

- **TCG/TPM SUPPORT**

Enable or disable (Default) TPM TCG (TPM 1.1/1.2) support in BIOS.

2.4 Boot Setting Configuration

Select the *Boot* tab from the setup screen to enter the Boot Setup screen. You can display a Boot Setup option by highlighting it using the <Arrow> keys. All Boot BIOS Setup options

are described in this section. The Boot BIOS Setup screen is shown below.

2.4.1   Boot Settings Configuration

You can use this screen to select options for the Boot settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.
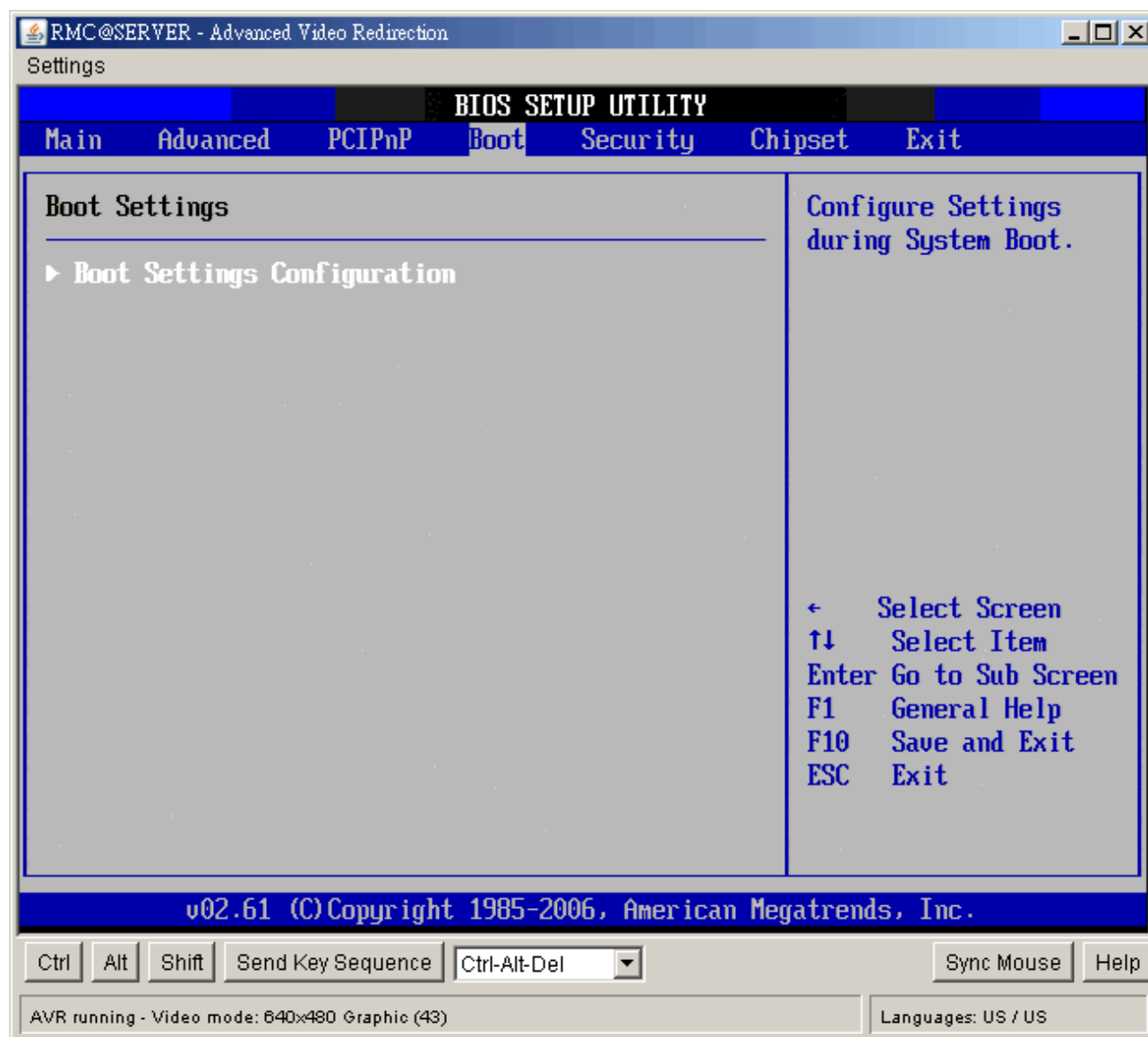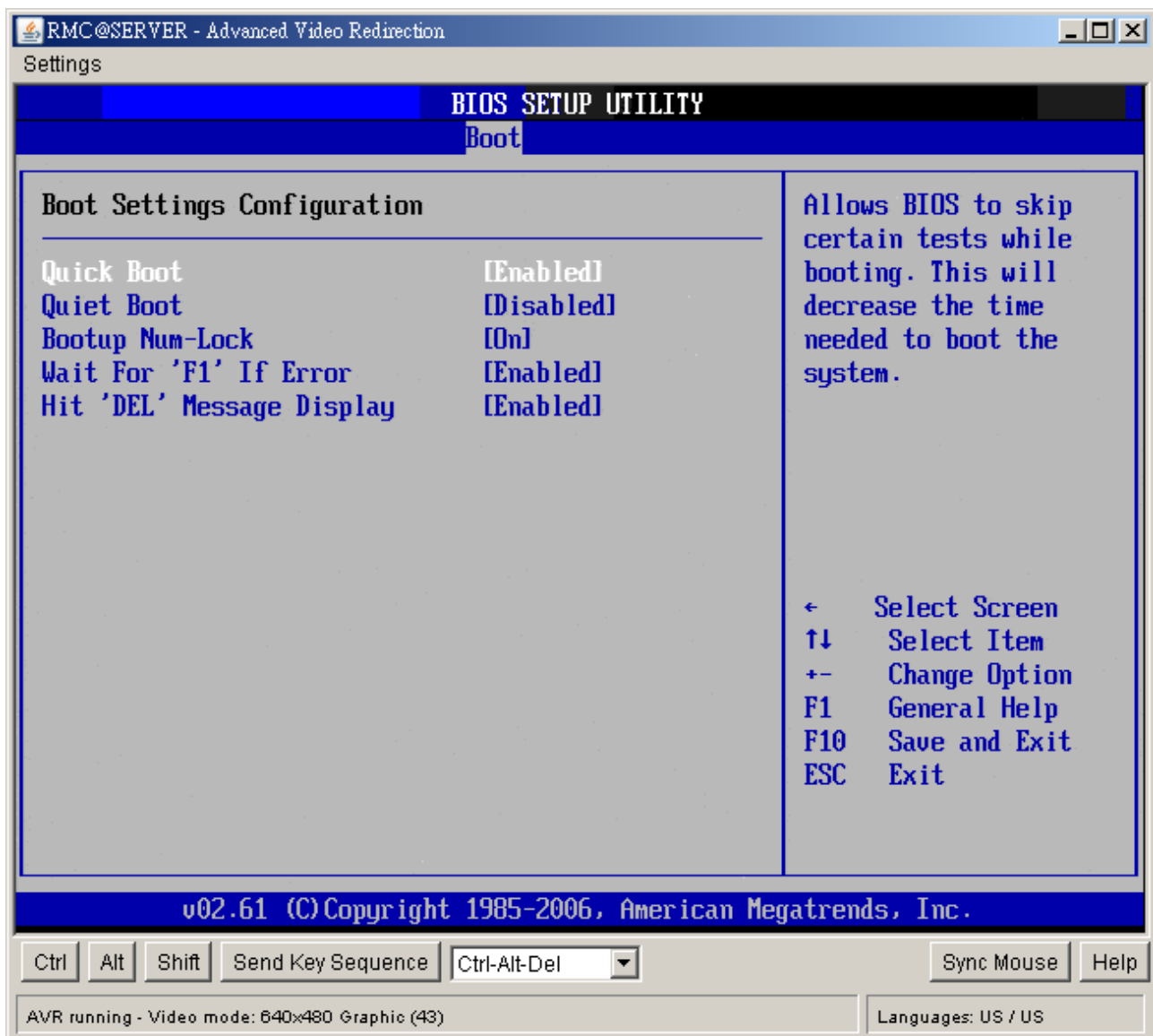
- **Quick Boot**

The default setting is Enabled.

Disabled	Set this value to allow the BIOS to perform all POST tests.
Enabled	Set this value to allow the BIOS to skip certain POST tests to boot faster.

- **Quiet Boot**

Set this value to allow the boot up screen options to be modified between POST messages or OEM logo. The default setting is Disabled.

Disabled	Set this value to allow the computer system to display the POST messages.
Enabled	Set this value to allow the computer system to display the OEM logo. This is the default setting.

- **Bootup Num-Lock**

Set this value to allow the Number Lock setting to be modified during boot up. The default setting is On.

Off	This option does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard will light up when the Number Lock is engaged.
On	Set this value to allow the Number Lock on the keyboard to be enabled automatically when the computer system is boot up. This allows the immediate use of 10-keys numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard will be lit. This is the default setting.

- **Wait For "F1" If Error**

Set this value to allow the Wait for "F1" Error setting to be modified. The default setting is Enabled.

Disabled	This prevents the to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to boot up in to the operating system. If "F1" is enabled, the system will wait until the BIOS setup is entered.
Enabled	Set this value to allow the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognized it. This is the default setting.

- **Hit "DEL" Message Display**

Set this value to allow the Hit "DEL" to enter Setup Message Display to be modified. The default setting is Enabled.

Disabled	This prevents to display "Hit Del to Enter Setup" during memory initialization. If Quiet Boot is enabled, the message will not display.
Enabled	This allows to display "Hit Del to Enter Setup" during memory initialization. This is the default setting.

2.5 Security Setup

Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- Change Supervisor Password

The Security Setup screen is shown below. The sub menus are documented on the following pages.
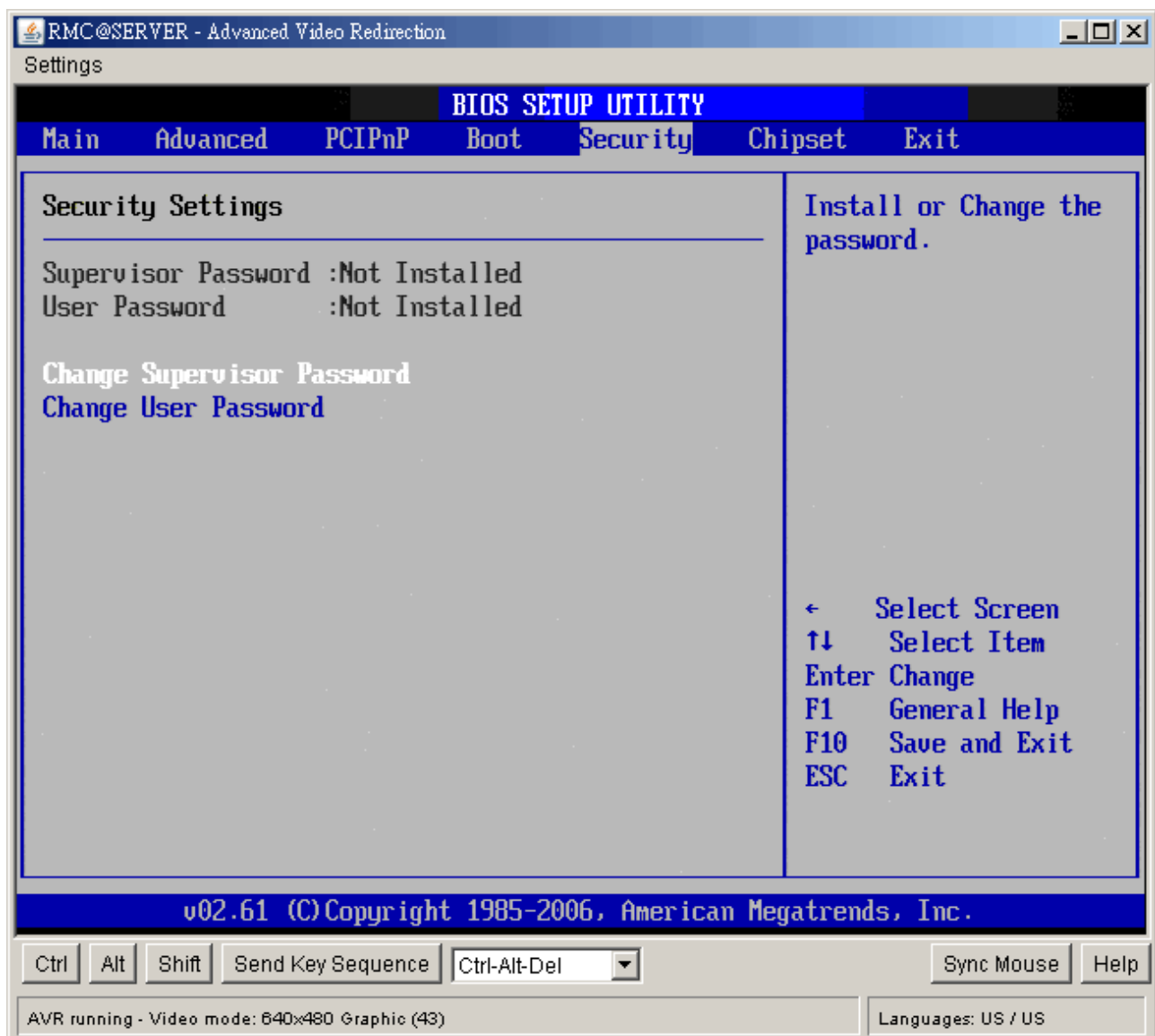
2.5.1   Change Supervisor Password

This item indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

2.5.2   Change User Password

This item indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

2.6 Chipset Setup

Select the *Chipset* tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Chipset BIOS Setup options are described in this section. The Chipset BIOS Setup screen is shown below.
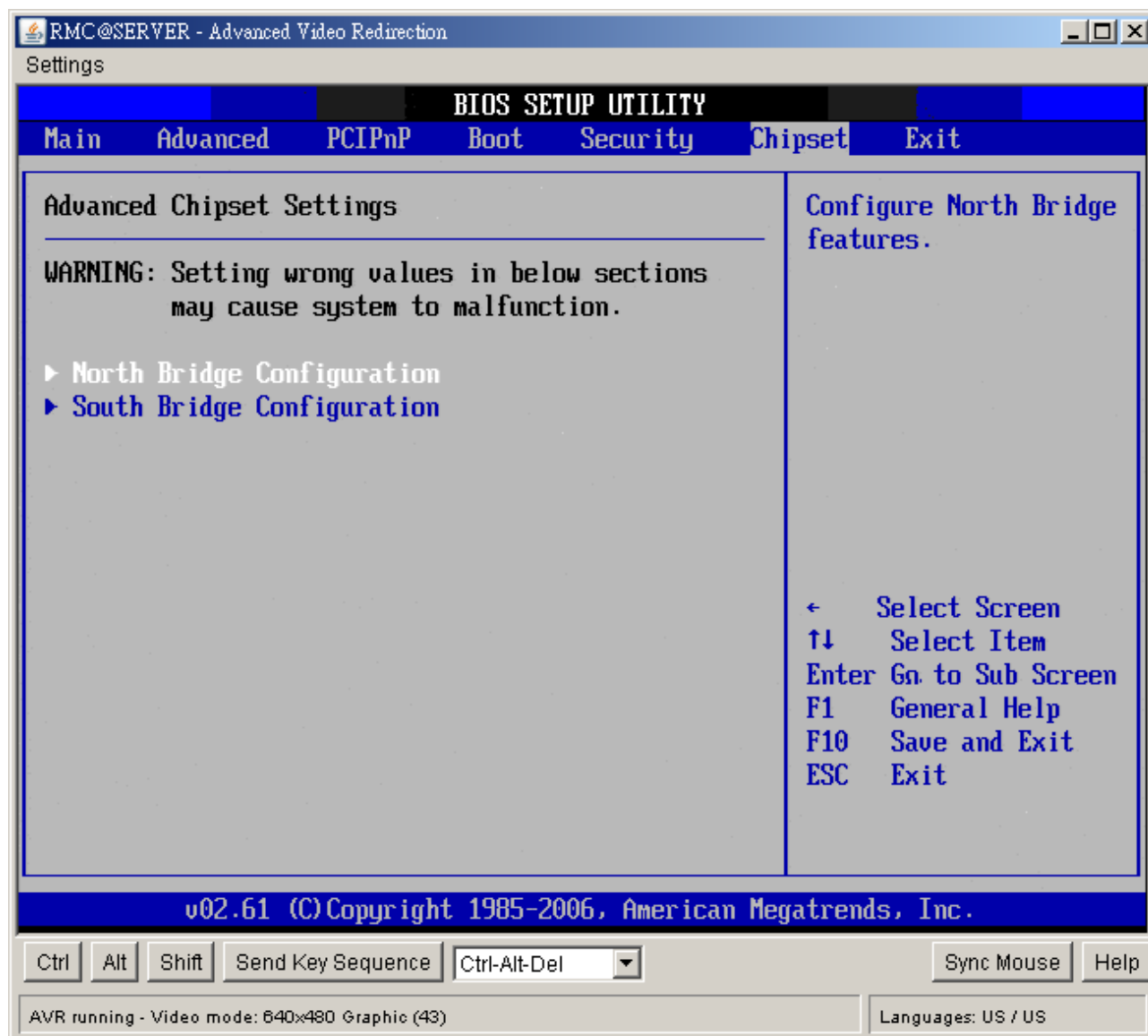
2.6.1 North Bridge Configuration

You can use this screen to select options for the North Bridge Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

Note: The North Bridge Configuration setup screen varies depending on the supported North Bridge chipset.

- **Boots Graphics Adaptor Priority**

This item selects which graphics controller to use as the primary boot device. The options are IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI. The default setting is PEG/PCI.

- **Internal Graphics Mode Select**

This item selects the amount of system memory used by the internal graphics device. The choices are Disabled, Enabled 32MB, Enabled 64MB, and Enabled 128MB.
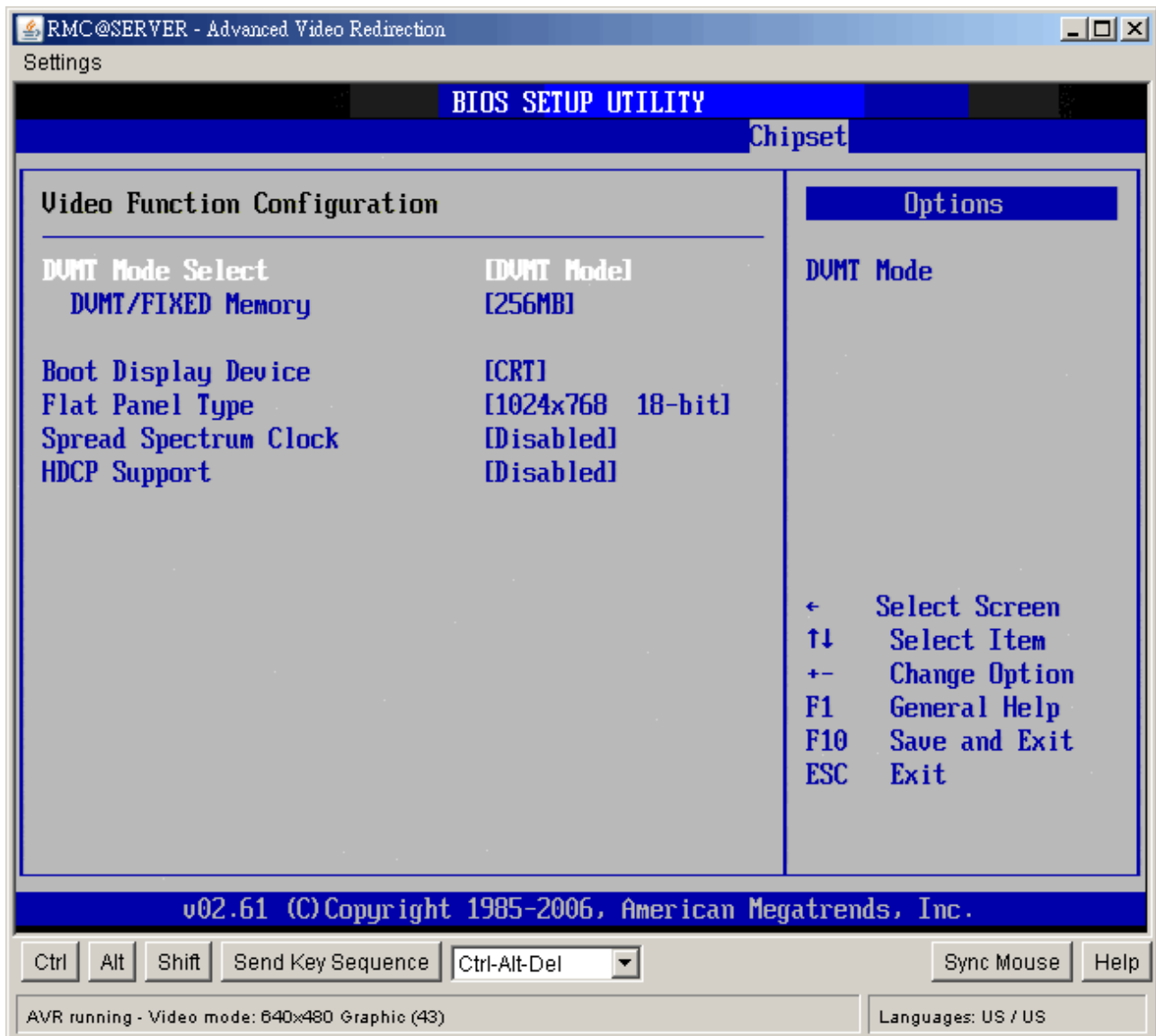
- **DVMT Mode Select**

   Use this field to select the memory to allocate for video memory. The choice is "DVMT".

   - **DVMT/Fixed Memory Size**

   Specify the size of DVMT/system memory to allocate for video memory. The options are 128MB, 256MB and Maximum DVMT.

- **Boot Display Device**

Use the field to select the type of device you want to use as the display(s) of the system.

- **Flat Panel Type**

This setting allows you to set your preferences for the boot display device.
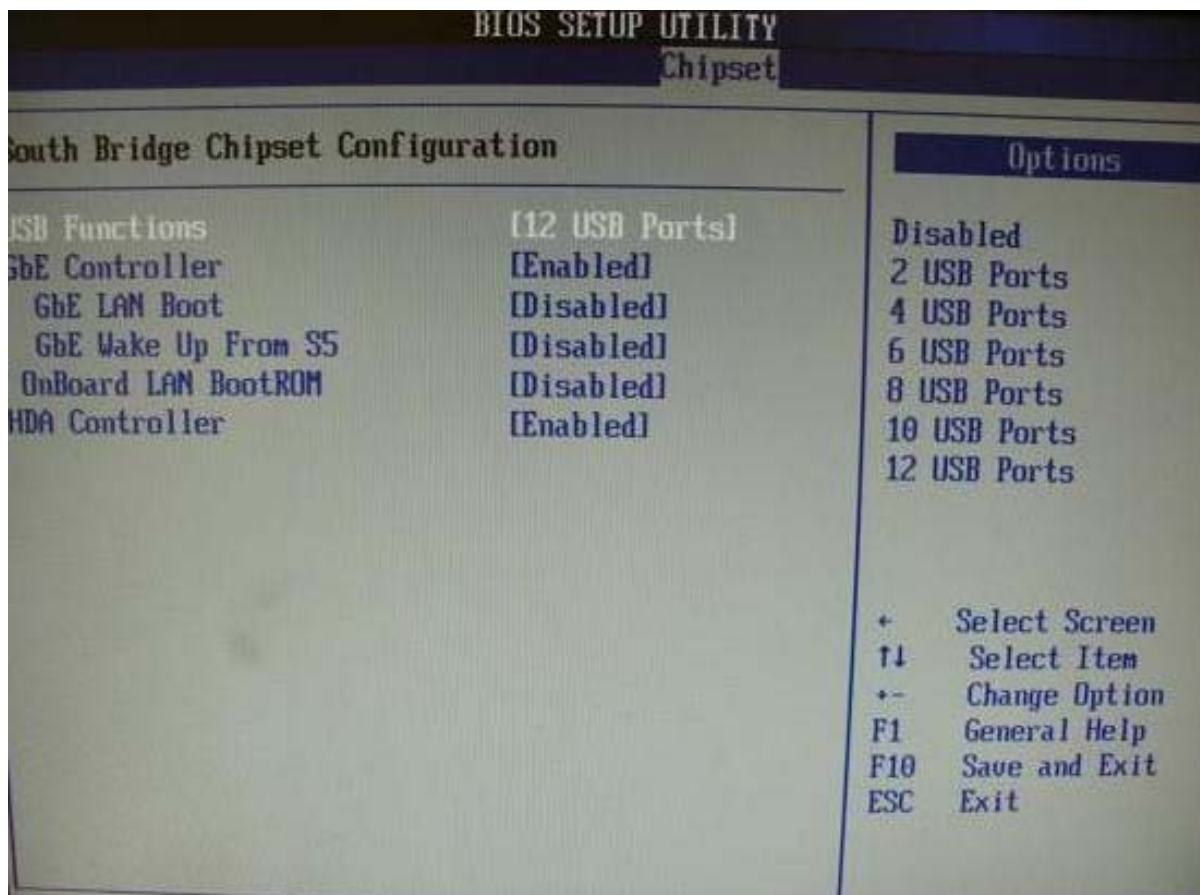
- **Spread Spectrum**

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The options: Disabled and Enabled.

- **HDCP Support**

HDCP(High-Bandwidth Digital Content Protection) is a copy protection protocol that was designed by Intel to prevent copying protected media as it travels across data lines. The choice are Disabled and Enabled

2.6.2   South Bridge Configuration

You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the basic I/O functions, USB ports, audio functions, modem functions, IDE channels, and PCI slots. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

```
                    BIOS SETUP UTILITY
                              Chipset

South Bridge Chipset Configuration              Options

USB Functions          [12 USB Ports]      Disabled
GbE Controller         [Enabled]           2 USB Ports
  GbE LAN Boot         [Disabled]          4 USB Ports
  GbE Wake Up From S5  [Disabled]          6 USB Ports
 OnBoard LAN BootROM   [Disabled]          8 USB Ports
HDA Controller         [Enabled]           10 USB Ports
                                           12 USB Ports


                                        ←     Select Screen
                                        ↑↓    Select Item
                                        +-    Change Option
                                        F1    General Help
                                        F10   Save and Exit
                                        ESC   Exit
```

- **USB Functions**

Set this value to allow the system to enable or disable the onboard USB ports. The choices are Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports, 10 USB Ports, 12 USB Ports.

- **GbE Controller**

Options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use onboard LAN controller.

- **GbE LAN Boot**
  When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

- **GbE Wake up From S5**
  This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

- **OnBoard LAN Boot ROM**

Options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use onboard LAN Boot Rom.

- **HDA Controller**

Options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use HDA controller.

2.7 Exit Menu

Select the *Exit* tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the <Arrow> keys. All Exit BIOS Setup options are described in this section. The Exit BIOS Setup screen is shown below.
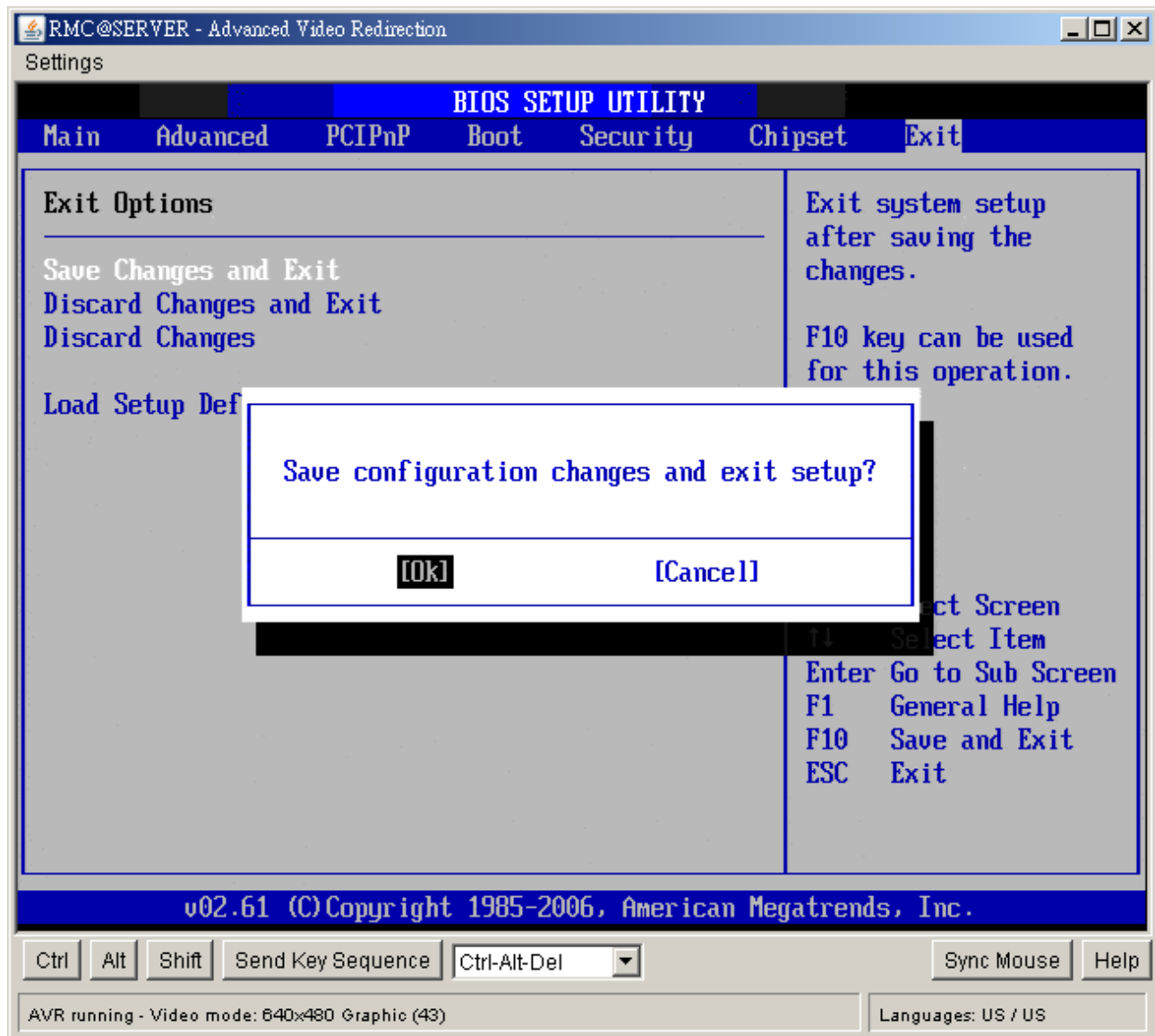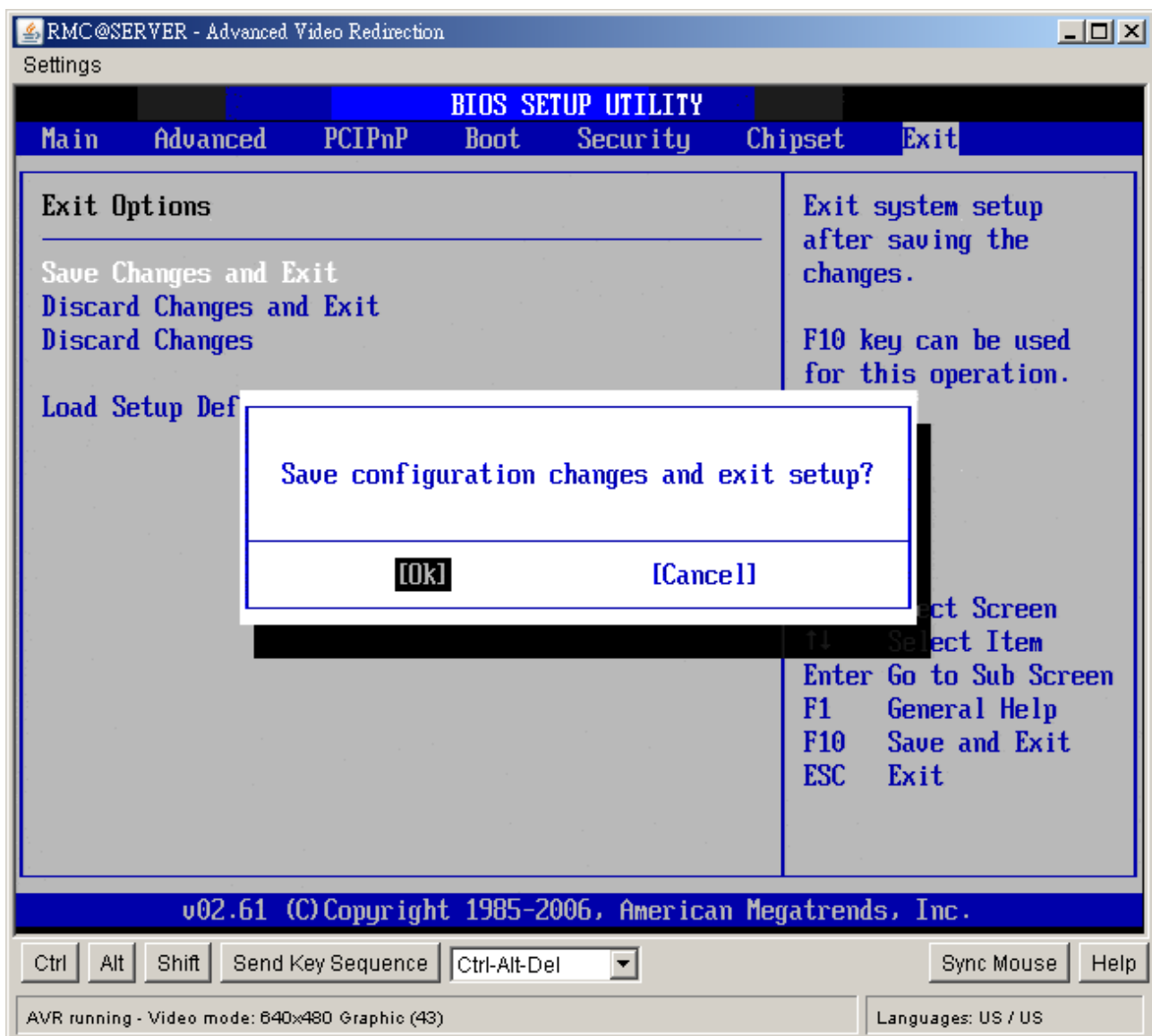
2.7.1   Save Changes and Exit

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Exit Saving Changes from the Exit menu and press <Enter>.

Save Configuration Changes and Exit Now?

[Ok]   [Cancel]

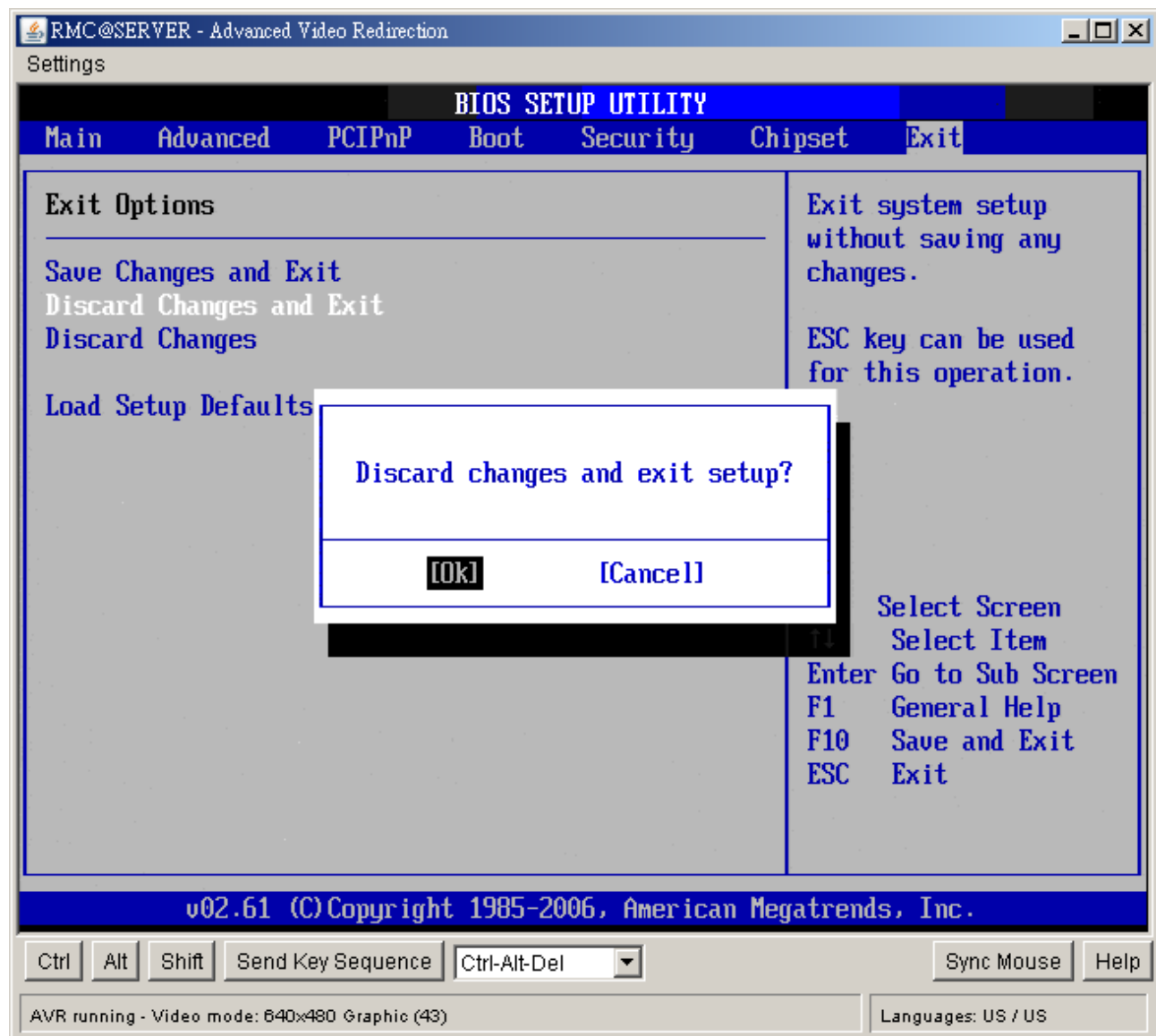appears in the window. Select Ok to save changes and exit.

2.7.2   Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration. Select Exit Discarding Changes from the Exit menu and press <Enter>.

Discard Changes and Exit Setup Now?

[Ok]   [Cancel]

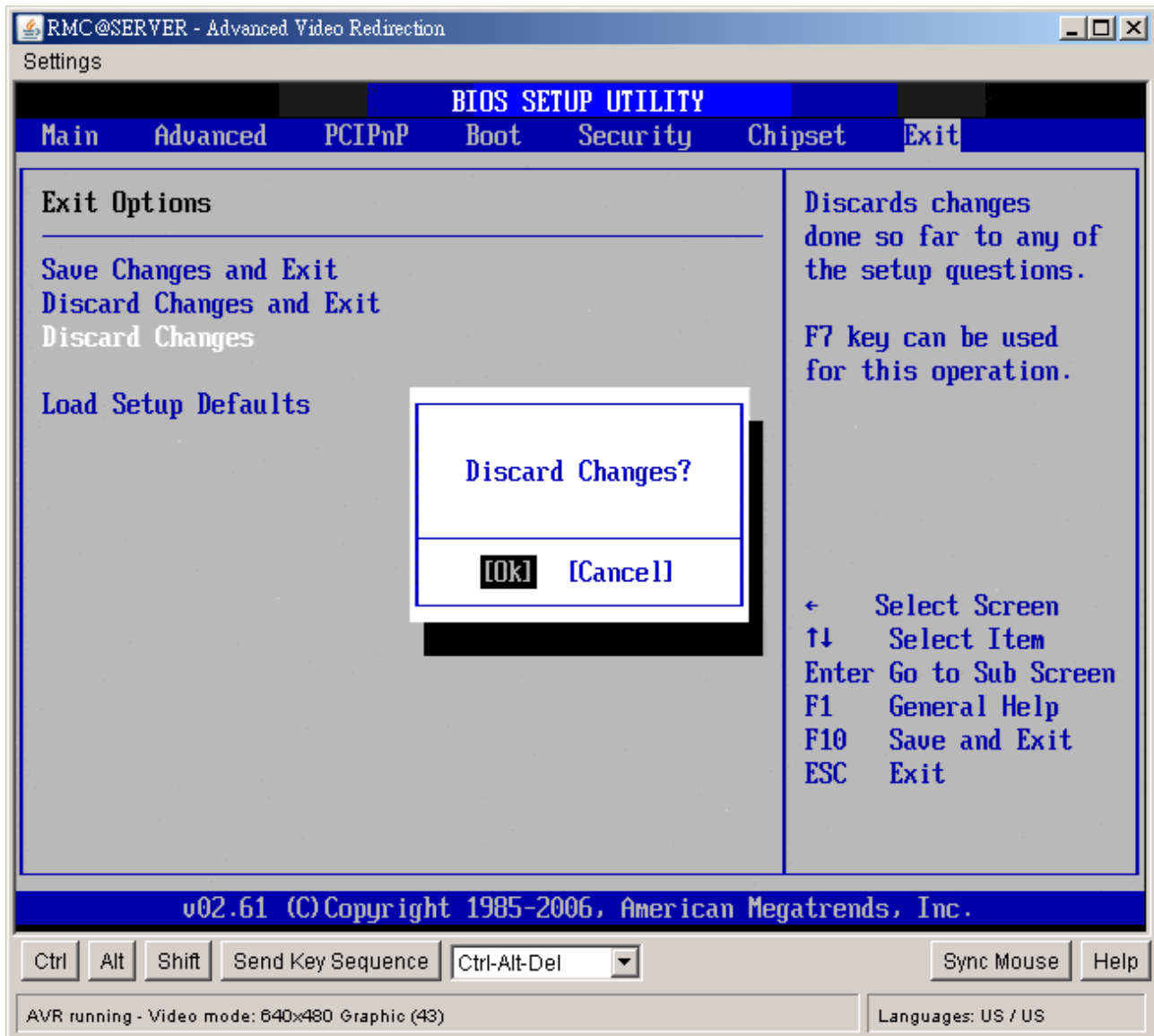appears in the window. Select *Ok* to discard changes and exit.

2.7.3 Discard Changes

Select Discard Changes from the Exit menu and press <Enter>.

Discard Changes ?

[Ok]   [Cancel]

appears in the window. Select *Ok* to discard changes.

2.7.4   Load Setup Default

Automatically sets all Setup options to a complete set of default settings when you Select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Load Setup Defaults from the Exit menu and press <Enter>. Select *Ok* to load optimal defaults.
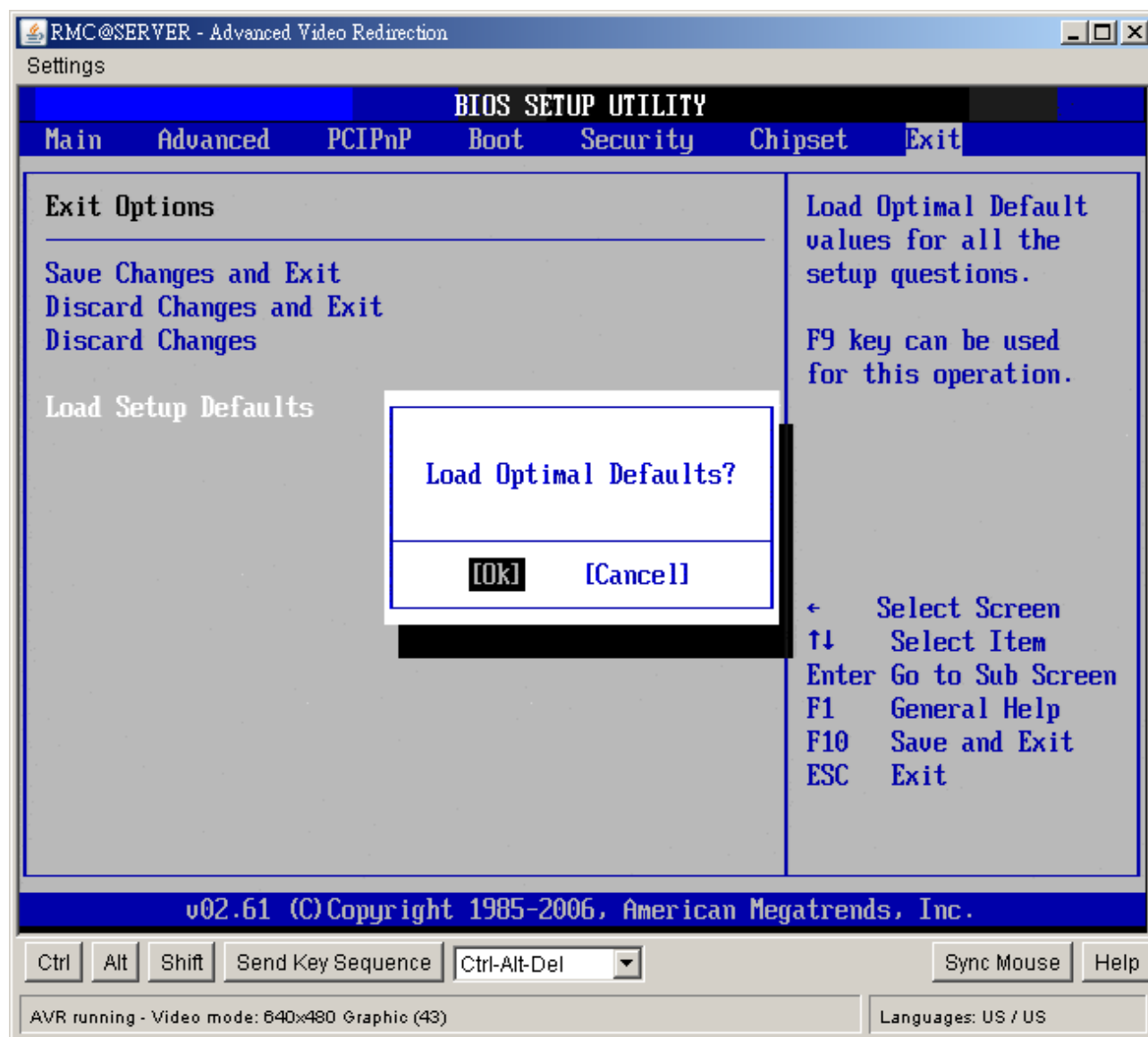
2.8 Bios Flash

2.8.1 4MB Bios Flash Note

IMPORTANT: Follow steps 1, 2 below before update Bios for proper Bios flash.

1. 1st memory Dimm Slot (Sodimm_A1) must **NOT** be occupied.
2. Insert single memory into 2nd Dimm Slot (Sodimm_B1).

Note: MAC address of on-board's 2nd LAN requires a re-program when flash a 4MB Bios. Please run flash.bat to flash Bios and update mac address.

Flash Bios:
1. Copy all necessary files* to a DOS bootable device such as USB –Flash drive
2. Boot to dos
3. Run flash.bat to get mac address and update bios, mac address will be stored in mac.bat
4. Reboot to dos
5 Run mac.dat to flash mac address.

*Files includes:
- FPT.exe Programming Tool
- Bios binary file
- Flash.bat
- Fpart.txt
- fptcfg.ini
- dos4gw.exe
- Eeupdate.exe
- RA3.exe
- Basic.txt